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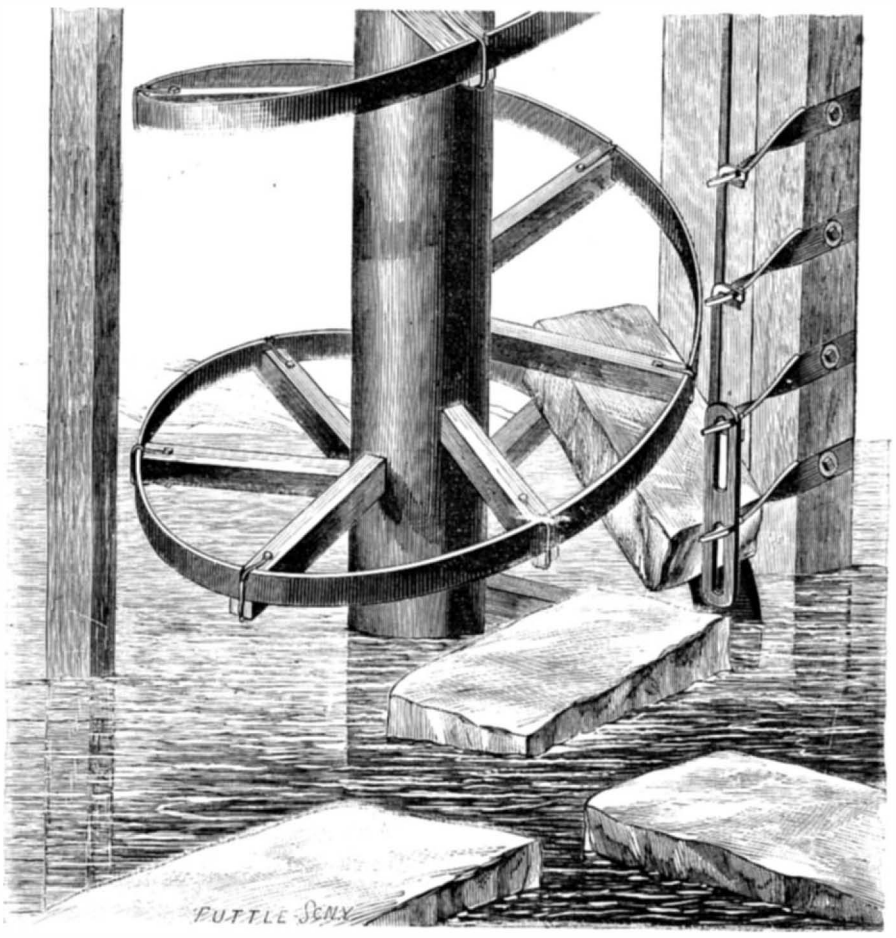
Method of Raising Ice.

The gathering of the ice crop in the Northern States is a business of great importance, and notwithstanding the invention and use of ice-producing machines, promises to keep its present position of value. Several means for raising and conveying the ice from the lake or pond to the storage house are already in operation, some of them requiring each block of ice to be attached to "cant-hooks" or some similar device and then to be raised by some modification of the pulley; or an endless belt or inclined railway is used, one end reaching below the surface of the water and the other reaching the highest portion of the building in which the ice is to be stored. In this latter case it is difficult to adjust the lift to the hight desired at the time to raise the blocks.

The plan shown in the engraving seems to be well adapted to the work of raising ice to any required hight, and discharging it at any required point as the ice house may be gradually filled. The contrivance is an upright shaft the lower end of which turns in a step located at the bottom of the pond, and the upper end in a box or bearing. Spokes radiate from this upright shaft in an ascending spiral, to the outer ends of which a continuous plate of iron is secured, which follows the lead of the spokes, thus forming a spiral. The lower portion of this spiral —that below the surface of the water—is made into a platform, or rather is much wider than the mere edge of the spiral itself. This is to aid in the landing of the cakes of ice for a start. One of the uprights which connect the top and bottom of the frame in which the shaft turns, has a series of horizontal arms which support a vertical guide, against which the block of ice presses as it is gradually lifted by the rotation of the spiral. The lower section of this guide is slotted where it rests on the arms to allow it to rise and fall, while the others between each arm can be removed as desired.

The operation is as follows: The machine rotated by manual labor, horse, or steam power, the blocks of ice are floated over the lower portion of the spiral to that side of the frame on which the guides are situated, and if brought in from the side shown in the engraving, as the direction the blocks are taking—on the right —the lower slotted section of the guide lifts to allow the block to pass under, and when it has passed falls again to place. The block then being held in position by the side of the frame, the guides, and the rim of the spiral, is gradually raised by the rotation of the latter until it reaches the hight where the chute is affixed for conveying the ice to the house. The guides being, as before stated, in sections, any portion may be removed to allow the ice to be discharged at any elevation desired, as the house is gradually filled.

A patent for this improvement was obtained through the Scientific American Patent Agency, May 21, 1867, by Henry Little, of Middletown, N. Y., whom address for additional particulars.



LITTLE'S ICE HOIST.

Method of Utilizing Heat in Steam Boilers.

The grand object of engineers, mechanicians, and scientists in the construction of boilers, is to ascertain a method by which the heat generated by the combustion of fuel can be made to yield its full quota of power. Approaches toward that end have been made by inventors, but in many cases the attempts have been too ambitious—the inventors have essayed too much at one time. Probably the advances to be made hereafter will be those in which adjustment of parts, and the improved arrangement of the apparatus, will have more real and actual value than the invention or introduction of novel boilers constructed on unphilosophical principles.

The nest of boilers shown in the engraving is designed to utilize a larger portion of the heat than is possible by boilers set in the ordinary way. It will be seen that the bridge wall back of the furnace is made inclined and curved to correspond with the curvature of the shell, thus compelling the flame to partially envelope the boiler, and strike the shell of the next boiler at a hight above any possible deposit of sediment. So in succession each boiler is partially surrounded by the heated products of combustion by means of the curved flues. In the lowest portion of these flues depressions are formed to receive the ashes, soot, etc., which are removed by means of doors in the wall of the furnace.

The furnace can be made smoke-consuming by introducing atmospheric air at those points of the flue of the highest elevation between the boilers, a portion of the smoke being thus consumed as it passes from one boiler to another, so that by the time it reaches the smoke stack it contains nothing combustible.

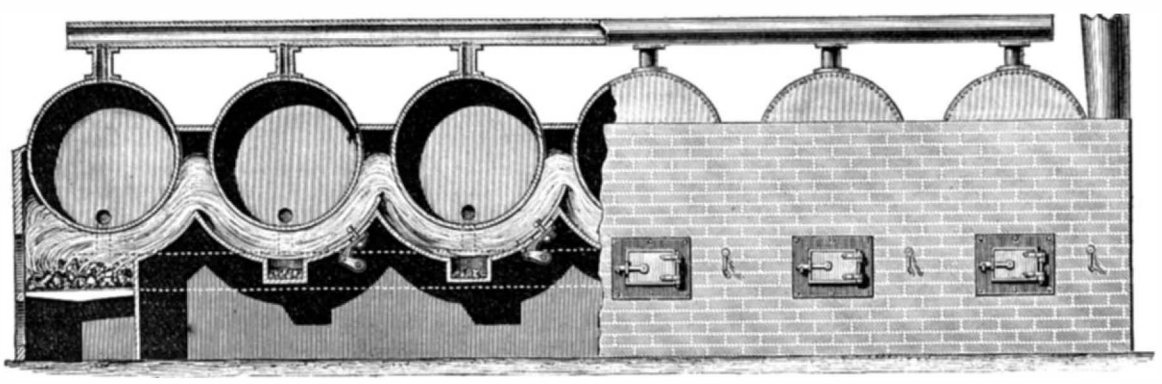
There are curved slides attached to the sides of the flues between the boilers, except between the first pair, and they are worked by means of cranks projecting through the sides of the furnace. These are intended to regulate the draft according to the changes of the weather, and to aid in the combustion of the gases. The dotted lines show the supply pipe which is connected to each boiler by a goose-neck.

This boiler has no internal flues or tubes and it is therefore less liable to unequal contraction and expansion than others. It is very much shorter in proportion to its diameter than the ordinary cylindrical boiler. The inventor says:

"The currents of water in these boilers are each independent of the others, so that one portion not generating steam will have no effect on the rest. In other boilers if you have not sufficient heat to generate steam in the end furthest from the fire the water so returning with the current will have to be heated again, which takes more fuel than would otherwise be required to generate steam sufficient for the use of the engine, and with the irregularity of the blaze you cannot cover all of your fire surface more than half of the time, consequently this intense heat will burn that portion of the boiler that is exposed to the only direct attack."

"There is no part of the boilers exposed to the heat but is readily got at and seen when they are empty, making repairing an easy job if such be needed. The fire is built on a grate surface in width nearly the length of the boilers, and is confined to the same width while playing on the surfaces, and being so concentrated it will have a greater penetrating force, not being weakened or separated by cylindrical, tubular, or globular forms usually made use of in all other steam generators."

This boiler and furnace was patented through the Scientific American Patent Agency Oct. 2, 1866. For rights, etc., address McClure and Ellis, Terre Haute, Ind.



McCLURE'S COMBINATION BOILER.

Soldering Iron and Steel.

M. Bernard Lietar, of Rue de Houblon, Brussels, has just patented an improved composition to be employed in welding or soldering iron or steel. This composition consists of 1,000 parts of filings of iron or steel, according to whether the composition is intended to weld or solder iron or steel; 500 parts of borate of soda (borax); 50 parts of balsam of copaiba, or a resinous oil; and 75 parts of ammoniacal salt (hydrochlorate, carbonate, or other). A mixture is made of the whole, which is then calcined and reduced to powder. To make use of the powder thus obtained M. Lietar proceeds as follows:—Suppose two pieces of iron, or two pieces of steel, or even a piece of iron and a piece steel, should be required to be soldered or welded one to the other. The composition is placed between the two pieces at the place to be united; the whole is put in the fire until the pieces have attained a temperature which permits the powder to become fused, which happens when the pieces have attained a cherry-red temperature. The pieces are then withdrawn and welded in the usual way. If the dimensions of the pieces, or any other obstacle, hinders their being put in the fire together they may be welded as follows:—Heat first one of the pieces to a cherry-red temperature at the place where the soldering or welding is to be made, then place the composition and apply the second piece, heated this time to white heat, then weld the whole together. This method is particularly applicable to the repair of large pieces.—*Mechanics' Magazine.*

The Planets on Show.

The months of Jnly and August are usually more favorable for the observance of atmospherical phenomena than any others during the year, on account of the great clearness of the atmosphere, besides the certain fixed laws of the universal system. At some periods, however, some exceptional phases of the planetary cycle display themselves beyond their customary attributes, and these periods occur in regular rotation. The present year will be singularly rich in such atmospherical phenomena; as, beside, a remarkable shower of meteors which is confidently calculated to take place on, or about the 10th of August, two of the planets are now exhibiting certain curious features of their orbit. For the last few days the planet Saturn has not only been peculiarly brilliant, but has shown its rings to be greatly increased in size. This can be readily observed with the naked eye, and with the aid of a telescope the rings are seen to be beautifully distinct. The flattened sides of these belts or rings of Saturn are now turned toward the earth, and that is the reason why they can be observed so clearly. The phenomenon will probably last for some days longer, and the curious would do well to take advantage of the opportunity they now have of witnessing it. Any ordinary telescope will do; but with a good field glass the belts come out as distinctly as possible, standing out, as it were, in relief. On the 21st of August the planet Jupiter will present tbe appearance of being moonless to European observers, although this sight cannot be witnessed in America, because Jupiter will be on the same plane as the horizon. The reason of this eccentricity in the arrangements of the planets is that three of its moons will be revolving across its axis and one behind it.

The meteoric display promised us on the 10th will be, according to the calculations of M. Leverrier, one of unusual brilliancy; in fact it is the one which delayed reaching us last November. The month of August is always rich in falling stars, consequently something out of the common must be of singular type and will attract great attention. These

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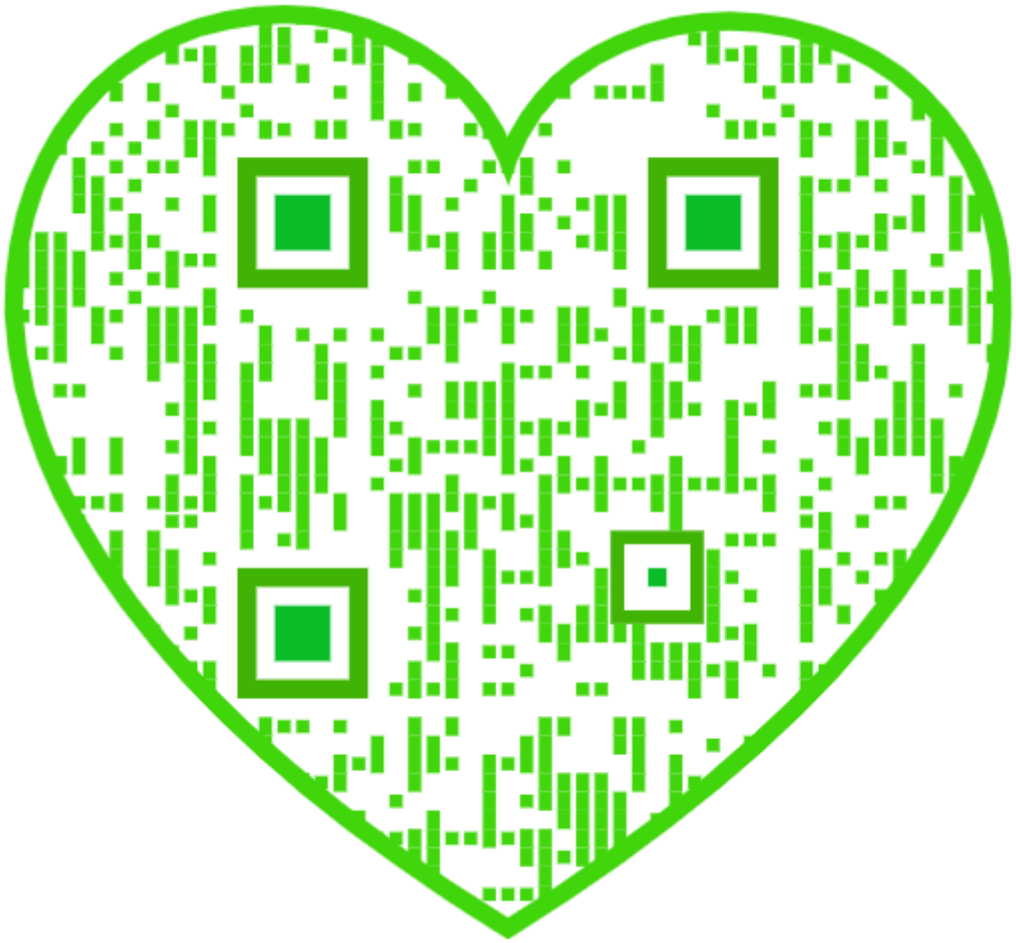

meteors expected to visit us move in an orbit exactly perpendicular to that of the earth, although Sir John Herschel seems to think that this fact would be contrary to the theory of the nebula. The meteors belong to a formation much more recent than that of our known planets, because the astronomers agree if they were of a more ancient date they would by this time have been transformed into a continuous ring. Our citizens should look out about the 10th of August, and they will then be able to form their own theories in the matter. The exhibition, at all events, promises to be extremely interesting, and the heavenly bodies are apparently now "a show."—*New York Herald.*

EDITORIAL CORRESPONDENCE.

Odds and Ends of Travel—German Art—Economy—Watering Places, and Gambling.

HOMBURG, July 15, 1867.

While in Holland I had fancied to myself a people very quiet, industrious, and above all honest. I thought that the cynical Diogenes would not look a long time about Amsterdam at midday with lantern in hand for an honest man, therefore imagine my surprise when I discovered that a hackman had actually attempted to cheat our party out of an hour's time by running us three times around the same block at snail pace, and when we remonstrated with him that it was hardly the right thing to impose upon innocent and unsuspecting strangers in that way he manifested no emotion whatever. He had evidently fallen from his primeval simplicity, for I have no doubt that he was an honest man before he became a hackman. Such is the lamentable apostasy which seems to attach to this profession.

I stopped for two days at Dusseldorf chiefly to visit the art galleries for which that old city has acquired considerable renown. There are about four hundred artists who reside at Dusseldorf, and some of the finest modern paintings are sent from their *ateliers*, many of which find their way to our country. The *concierge* of the hotel where I stopped, remarked to me that he could always distinguish an American from an English traveler. I asked him how he could do this and he replied that an American always rushed for the picture galleries while the Englishman went knocking about town to see the buildings. I think this observation is in the main true. I have made it my business thus far to visit all the principal picture galleries in the line of my travel, and I have had occasion to notice a very great preponderance of our countrymen among the visitors. This does not arise, however, from the fact that American travelers are more fond of paintings then the English, but simply because our people have much less frequent opportunities to indulge their fondness for the fine arts; beside, many English travelers have a sort of contempt for pictures unless they are painted by an Englishman.

All the chief cities of Europe consider that a picture gallery, a museum and a zoological garden are indispensable to their completeness, and but for these features European travelers would not trouble themselves to visit many places that have now become very common resorts.

The comparatively small city of Cologne which contains about 120,000 inhabitants, has an extensive museum, an art gallery, and a splendid floral garden, beside one of the finest collections of living animals and birds to be found in Europe. New York with its million of people has Barnum's Museum of stuffed elephants and monstrosities, also a few sickly specimens of wolves, monkeys and eagles at the Central Park, beside a tolerable show of good pictures at the National Academy once a year. As a resident of New York I feel ashamed of her record in respect to these matters. I was not very much impressed by the collection of pictures at the Dusseldorf Academy. The chief fault seemed to me to be in the unusual coloring of landscapes. Some of the German and French artists appear to have discovered a new green in nature which I have been vainly looking for ever since I commenced my travels. Some of the most highly finished pictures in the collection were sadly marred by this defect. The most successful scene painters in Germany are the brothers Achenbach who reside in Dusseldorf. In all their works they seem to be endowed with a sort of divine inspiration. Among the few very pleasing pictures on exhibition at the town hall was a large canvas by Oswald Achenbach which represents an old country mill with the usual accessories of hill, wood and water. The artist seems to have made his studies immediately after a shower, when Nature appears "all glowing in Eden's first bloom." I think it the most pleasing picture of the kind that I have ever seen, and if any one of our liberal patrons of the arts desires to possess a splendid work he has only to send forward a bill of exchange for five thousand dollars. Good pictures by first-class artists are very high in Europe, therefore an immense amount of poorly prepared canvas is sent out and sold in our markets.

Immediately upon passing the frontier from Holland into Prussia the traveler notices that he is under another nationality. From a quiet, pastoral country, full of black and white cattle, sheep, canals, windmills and storks, this scene changes into a fortified camp, bristling with guns, bayonets and soldiers, and the long shafts belching forth huge volumes of smoke indicate also an active manufacturing district.

Rhenish Prussia is famous for its extensive iron works, the most noted of which are those of Krupp at Essen, which furnish employment to about ten thousand men, and are kept running day and night. "Murray's Guide Book" with characteristic modesty informs the traveler that the breech-loading cannon of Krupp are not equal to Sir William Armstrong's, while the Englishmen themselves would be very heartily glad if this statement had even a shadow of truth in it. It was my intention to have visited some of these extensive establishments, but I learned from good authority that just at this time American visitors would doubtless meet with a cold reception. It seems that a Pittsburg iron maker recently came to Prussia for the purpose of procuring skilled workmen. He brought with him thirty thousand dollars in money, and two native Prussians, hoping through their influence to induce workmen to emigrate. Witholding the real purposes of his visit, he obtained a courteous admission to the works, which he will doubtless profit by, for it is well known that for some reason apart from the mere price of labor, the manufacture of iron is carried on much more economically here than in the most favored localities of our country. The iron makers were naturally very indignant when they discovered that their guest was secretly at work through his paid emissaries endeavoring to induce workmen to quit their employment. There is no law in Prussia that prevents its subjects from leaving the kingdom, but there is a law which severely punishes any one who induces them to leave. The consequence was that the unfortunate accomplices were thrown into prison where they now linger, while the principal made haste to get out of the way. An effort is being made to procure the release of these men but the impression is that they will be held for two years, which is the full penalty of the law. I believe, however, that nearly two hundred workmen have already emigrated, and the result may be that some of these old workshops may be depleted of practised hands, who will find more comfort and better pay with us than it is possible to obtain in their native land.

Speaking of economy, I am every day reminded of the wasteful extravagance of our people compared with what exists in Europe. I believe that the superfluities of American families would support all the poor people of this kingdom. Nothing in Europe seems to be suffered to go to waste. In the city of Paris soup is made of almost everything in the vegetable kingdom. Even the common sorrel which goes for nothing in our country is regularly sold in the markets and is made up into a delicious condiment for fish, and all the broken victuals of the hotels and restaurants are gathered daily, put into papers and regularly sold in a market for a small price. The ordinary *table d'hote* dinners in Europe do not cost on an average more than one half as much as they do in our country, and yet every one seems to get enough. I do not speak of what travelers pay for their meals, that depends upon circumstances; but I allude to the first cost of the food. An American breakfast at one of our first-class hotels would pass for a splendid banquet in this country. An Englishman remarked to me that he never saw such profusion of food in any other country but ours. Living is reduced to a science in Europe, and I must confess that independent of horse flesh and ass meat it is much more sensible than that which it has attained in our country as a general thing, but as a general thing there is no other such country as our own. The broad fields of the West yielding their abundance induces extravagance in living with us which could not be indulged in here, where poverty among the masses forces upon them the most rigid habits of economy. A laborer does not average more than sixty cents for a day's labor, and out of this he must in some fashion support himself and children, but not his wife, for at almost any sort of work, whether employed to sweep the streets or in field service she can "hoe her own row." I always commiserate the situation of women who are compelled to do manual labor in the field. I also pity a dog when I see one harnessed to the milk and vegetable wagons, both sights being common here, and both to my mind unnatural. I hope the time will speedily come when this degradation of women shall forever cease, and if the dogs are of no other value than to draw about heavy loads and for which they were never designed, then, I advise that their tails be cut off close behind their ears.

In my trip up the beautiful Rhine I indulged myself in a short experience at the famous German watering places. Upon reaching Coblentz, which is a very strong military point, I heard that the King of Prussia was expected to arrive the next day at Ems. Wishing to see with my own eyes how a king was to be received by his own people, I took a carriage, and after a ride of nine miles up the lovely valley of the Lahn reached Ems just in time to see his Majesty ride through the town. The houses were finely decorated by flags, wreaths of vines and flowers, and what struck me as a very marked and singular act of devotion was the temporary planting of trees all along the streets of the city at distances not more than ten feet apart. Upon inquiry I learned that the work was done by the soldiers of the garrison and occupied their time for three days. The King, dressed in the fatigue suit of a General, rode in an open barouche unattended except by his adjutant, and was received by every mark of respect. His Majesty is a bluff old gentleman upward of seventy years old, and is excessively fond of his army and delights to wear the military dress.

Ems is delightfully situated under the mountains and affords an agreeable retreat to those who imagine themselves out of sorts, as they can freely imbibe warm dish water, and ride up the hills on donkeys, and try their luck at the *roulette* and *rouge et noir*, which always amuses a gaping crowd and gives general satisfaction to the saintly-looking gentlemen who shuffle the cards, turn the wheel, and rake in the change, the latter operation seeming to keep them quite busily employed. At Wiesbaden the same round of delights are always in store for the visitors, only a little more so. As this fashionable hot watering place is more easy of access, the number of human donkeys who go there is correspondingly increased. I am now at Homburg, which to my mind is by far the most sensible watering place in Germany. The waters here are similar in character to those of Saratoga, and when judiciously taken are wholesome and life giving.

The great feature of all these German watering places are the Kursaals, a most appropriate name for these gilded gambling hells. The building erected for this purpose at Homburg rivals in its extent and magnificent decorations, gardens, etc., an imperial palace. It is supplied with large free reading rooms, dancing and concert halls, also supper and refreshment rooms where meals are furnished cheaply and good, but several of the most splendid apartments are given up to gaming. It is interesting to study the faces that gather about these tables. Old men and old women who seem to stand under the very shadow of the skeleton. Young men and maidens, all alike victims of an infatuation which has ruined thousands, and yet they learn nothing from the experience of others, they must gain it for themselves. A Russian Countess, an old women, an invalid upon crutches, seats herself at the table. Haunted by some superstition, she tells her valet that she will not begin to play for fifteen minutes. She asks the time; answer, "five minutes gone." She sighs "Oh!" Impatient still to begin, she inquires again; answer, "five minutes more;" another sigh; she inquires again; "one minute more," and the face of this old creature, who might pass almost any where for a pious matron, suddenly lights up with unwonted enthusiasm. She throws down her money upon the table, it is raked in, she throws again, it is gone, and in this way with occasional streaks of good luck she squanders annually, it is said, $50,000 to gratify her very morbid passion for gaming, and thus day after day this gilded villainy goes on, but the general impression is that Bismarck and the King will abolish the whole business of gambling in their dominions.

Quitting the healing, gambling springs, the vine-clad mountains, the crumbling fastnesses and romantic valleys of the Rhine, I must journey on toward Berlin and Eastern Germany.

S. H. W.

Special Correspondence of the Scientific American.

TRANSMISSION OF WATER POWER FOR LONG DISTANCES

PARIS, July 16, 1867.

On a recent visit to the Falls of the Rhine at Schaffhausen, I had an opportunity of examining a system of transmission and distribution of power which is in operation there, and which is certainly of sufficient importance to make a description of it interesting to your readers. The problem of perpetual motion, the solution of which so many have so persistently and vainly sought, was long ago solved by Nature in the flowing of never-ceasing rivers. Here is a power which we may make use of for all time with no other expense than the inevitable wear and tear of our gearing. Notwithstanding this, for a variety of reasons water power is only used to a comparatively limited extent where it exists, while in many cases where enormous power is available, it is not utilized at all. Leaving out of consideration altogether those cases in which from the remote situation of a fall it would be commercially impracticable to establish works around it, we know that it is only occasionally that we find large collections of factories driven by water power, and one of the chief reasons of this is the great difficulty and expense of conveying the power to points removed even a short distance from the main fall. If canals and waterways are to be constructed, water wheels in great numbers established with all their accompanying locks and gates, we have at once a system of works requiring enormous capital, the interest on which will go far to neutralize the advantage to be gained from the cheap supply of power.

The system which is in operation at Schaffhausen as well as at a number of other places in Europe, is the invention of a M. Heirn, and the purpose of it is to avoid the necessity for the construction of the costly works alluded to, by the substitution of a single, or a small number of large wheels, in close proximity to the waterfall, and thence to distribute the power in a cheap manner over the entire district occupied by the town. The means employed are remarkable, not so much for their novelty as for the patient thought and experience that have been expended in bringing the system into a practical form, a task which now appears to be successfully accomplished. The power is carried from the water wheels to its points of consumption by wire ropes moving at a very high speed around suitable pulleys of large diameter, and I shall probably be best able to illustrate the system by describing the works at Schaffhausen. The town with its factories is located about two miles above the Falls of the Rhine, so much visited by travelers as being the largest in Europe. The river where it passes through the town is broken into a series of rapids with a depth of water almost equal to that at Niagara, and a width of about 350 feet. In the midst of these, near the left bank of the river, is situated the wheel house, which contains a single turbine wheel of large size and giving sufficient power to drive all the mills in the town. The vertical shaft of this wheel carries a large bevel gear at its upper end by means of which its motion is transmitted to a horizontal one by its side, the gearing being so arranged that the latter makes a little more than two revolutions to one of the wheel, the speed being about 100 revolutions per minute. On this shaft are placed two wheels of cast iron about 14 feet in diameter with a deep groove formed in their face. In this groove are secured segments of hard wood with a slight depression for the wire rope to run in. The grain of the wood in some cases runs lengthwise, and in others across the face of the wheel. These wheels are made in four sections, so that they may be readily taken apart when required, for repairs. They are free to turn on the shaft and are driven by an equalizing coupling placed between them. This part, which has for its object to prevent one wheel from doing a greater proportion of the work than the other, as would be the case if one of the ropes happened to be tighter drawn than the other, has not unfrequently been used for the same purpose in other cases. It consists of a strong sleeve of cast iron secured to the shaft at its center, and having projecting from it on opposite sides,

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two stout arbors each carrying a heavy bevel gear. These gears take into similar ones secured to the large pulleys, and transmit the motion of the shaft to them. If the rope on one wheel pulls tighter than that on the other, the intermediate gear on the driving coupling will turn slightly and relieve somewhat the tension on the one wheel, while the other will be revolved in the opposite direction until it comes under the same tension as the first. The ropes that run on these pulleys are a little over an inch in diameter. At the speed above mentioned for the pulleys, it will be seen that the speed of the ropes will be about 4,400 feet per minute, or say 50 miles per hour. The difficulty of providing practically for such a speed will be apparent to every one who has had any experience in similar undertakings, and as a matter of fact, this has been the great difficulty to be met in carrying out this plan of distribution, and it is only after a long series of trials that this has been successfully accomplished.

As already mentioned, the driving and driven pulleys at Schaffhausen are of iron, faced with wood; in other cases, to be mentioned presently, another combination is used which has given the most satisfactory results, To continue, however, our description of the present apparatus. On the opposite bank of the river, or rather a few feet from it, are built some solid stone piers on which is placed a second shaft and pair of wheels, similarly arranged to those in the wheel house, and high enough to keep the ropes in their transit clear of the water The shaft is about twelve inches in diameter in the body and seven inches at the journals, and is supported in iron housings firmly bolted to the piers. By a pair of bevel gears the motion of this shaft is transmitted to another at right angles to it, carrying another exactly similar pair of wheels running in a plane in the direction of the course of the river instead of across it. Coupled to the end of this shaft is a small one which takes off a portion of the power to some factories situated just at this point on the bank. From the large pulleys a second pair of wire ropes carry the power to a third pair of wheels about 400 feet up the stream, and from here again it is transmitted a similar distance to another pair, and again to another, the pulleys being made with double grooves in their faces to accommodate the two ropes that pass around each of the intermediate wheels. At any of these points a portion of the power may be taken off, and this is done in a variety of ways as may be most convenient under the particular circumstances; sometimes by gearing and shafting, or again by small pulleys carrying a smaller size wire rope, say half an inch in diameter. On the last span, but one rope is at present in operation, the coupling between the two wheels being locked to prevent it turning, but new piers and housings are being erected for the purpose of transmitting the power to a still greater distance, and then the second rope will be required. As a rule, the speed of all the successive wheels and branch lines of shafting is kept the same, namely, one hundred revolutions.

This system of transmitting power to a distance has been a subject of great study during the past ten years and is now being applied to much greater distances than those here mentioned. Where longer intervals than, say, 450 feet between the large pulleys occur, it becomes necessary to provide pulley supports to sustain the weight of the rope. These are made six or seven feet in diameter, and it is these in particular that have given so much trouble. With the high speed of cable used it was soon found that the wheels were very rapidly destroyed, or if made of any substance hard enough to resist the action of the cable, they in turn as rapidly destroyed the latter. This has at last been obviated by filling the dovetailed groove in the face of the wheels with gutta percha, driven in hard, and it is stated that wheels so constructed have been in use seven years without injury. The inventor and the constructing engineers, Messrs. Stein & Co., of Alsace, who have introduced the system, estimate that it is possible to transmit 120-horse power twelve miles with a loss of but 21-horse power. The cost is stated at £320 per mile for everything, including cost of erection, and £1 per horse-power for the terminal apparatus, which of course is small in comparison with that of any system of transmission of the water itself for similar distances, and the only question remaining is the relative cost of repairs. If the statement published may be relied on, these are not excessive with the new system. The comparison with the method of transmitting the water bodily, illustrates beautifully the theoretical principle which is involved in this means of working, viz., the reduction of mass and the increase of velocity, the quick running rope carrying in itself all the power of the ponderous mass of water slowly flowing through an ordinary canal. The importance of some system for the transportation of power can hardly be overestimated, and it is a matter of surprise that more serious attention has not been given to it by engineers. It is certain that, looking forward at least to the time when our fuel beds shall be exhausted as they one day will, such immense supplies of power as exist at Niagara will not be permitted to run to waste, and the first steps toward the practical accomplishment of such a utilization of it, are accordingly of peculiar interest. SLADE.

A Valuable Invention.

The attempt to secure an English patent for a plan of "preventing financial crises" was not successful. But a better fortune has smiled upon the application of a certain Mr. Liegher, who has been granted a patent for the manufacture of the vital fluid, as he calls it. This imponderable fluid, is developed when a nitrogenized substance comes in contact with a carbonized one. It is not electricity, as it passes through bodies which do not conduct electricity. Nitrogenized bodies, like silk, are its best conductors. To make it, he takes a bladder full of liquid ammonia, and places this in a vessel containing molasses. At the neck of the bladder is a silk cord attached, and another such cord hangs in the molasses. When the ends of these silk cords are joined, the current of the vital fluid is established, as may be seen by placing animals in the circuit, when they become very lively. The effects are hightened by combining several of those elements as we combine the elements of a galvanic battery.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

River Embankments---Mississippi Levees.

MESSRS. EDITORS:—The article of W. J. B., in your paper of July 5th, though courteous and unexceptionable in its tenor, seems to require of me a reply. He considers that my proposed plan of timber piling, sheet piling, and inclined planking in front of all new large levees, though in its general features good, is yet on the whole, too expensive, and liable to decay. He proposes instead of it a battened plank fence in the middle of the levee, and a front protection of "willows, or any shrub of southern growth, which roots well," or that "the outer slope should be protected with stone." Experience has demonstrated that embankments of Mississippi sand or loam—the only material obtainable—are unreliable. The losses, only to be estimated by millions, resulting year after year, from inundations caused by the breaking or cutting of the levees, have driven the inhabitants of the valley nearly to desperation; they are abandoning lands which, in fertility, can hardly be equalled on the globe, and the present value of these lands is but a fraction of what it was. I maintain, as the result of twenty-one years' study and observation of the lower Mississippi, that every acre in the valley, above the channels required for interior drainage, can be reclaimed permanently without increasing the high-water line of the river, and that levees can be relied upon if properly constructed and maintained. As before remarked, levees of Mississippi earth alone, are unreliable. Stone, for the protection of the river slope of levees, would answer a good purpose, if we could get it. It would have to be transported at enormous cost for hundreds of miles. Neither stone, gravel or even coarse sand is to be found on the alluvial banks of the lower Mississippi. The fine sand mixed with clay found everywhere on the banks of the river becomes mud or silt when saturated with water and disturbed. The placing of "the more open and porous material in the slopes" would be very well, but, like stone, where are we to obtain it? Levees have to be built of the earth obtainable where they are built, and that is, a fine sandy loam more or less mixed with clay. "A front protection of willows" would answer a good purpose, but, willows only grow in water or wet ground, while the levees become as dry as it is possible for earth to be, during low water and the dry season. The first rise, after the new levee is built, is what endangers it most, and willows, even if they could be made to grow on the slopes of levees, would require several years before they would be of much benefit. I have myself proposed a method which I think would answer a better purpose, and this is the thatching or shingling of the outer slope with successive layers of green willows, or bundles of willows—fascines—secured in place by means of transverse poles and stakes of green willows. This, if done just before the rise of the river, or in the winter—the river generally begins to rise in March, and is highest in April and May, though we always expect a partial rise in January—might result in the rooting of the willow stakes, and prevent their giving way. The willows forming the thatching or fascines, where they touch the ground—which would be kept moist for a time even after the decline of the river, by such a covering—might also root well, for the first year. I apprehend, however, that they would die during the low water and dry season in the fall months. However, as the protection of the new or green levee during the first rise of the river after its construction is a matter of the highest importance, for it acquires solidity or cohesion, and grass grows upon its rear slope forming a sod before the next rise, I think that my plan of thatching or fascining in the manner described would be useful. Any quantity of young willows can be obtained, and, so used, they would protect the levee front from the action of the river waves. A fence in the middle of the levee has been proposed years ago by myself and others, and in combination with my system of thatching or fascining it would do very well for small or moderate-sized levees. But for large levees, ten, fifteen or twenty feet in hight—and these, when a crevasse occurs in them, are what occasion our desolating inundations—a simple fence would not be reliable, except as a bar to the crawfish. Crevasses occurring in small or moderate-sized levees can readily be closed, but when they occur in larger ones, owing to the unstable nature of the bottom and sides of the opening, they are seldom, if ever, closed until the river falls. Like an arch, when added to a bridge truss, the woodwork added to a large levee must have strength sufficient to sustain the load or pressure of itself. I recommend wood, because we have an abundance of durable cypress and no stone; brick masonry would be very expensive. Wood can also be rendered durable by creosotizing it, or by adopting the Robbin's process; bnt only the exposed portions would need it.

As to the question of cost, I think that is a matter of secondary consideration, but of course that plan which will insure safety, at the least expense, is the best. The amount expended for a wall of brick or stone masonry, would be incomparibly less than the losses sustained by the failure of a large levee.

Non-residents, or persons unacquainted practically with the difficulties to be surmounted in the construction and maintenance of the Mississippi levees are apt to underrate them. A body of water of the width and depth of that river, flowing with a velocity of nearly five miles per hour, is a different thing from the still-water pond or canal, even if the material or earth we have to use for embankments were as good. The difficulties to be overcome are the following:

1. The washing away of the front—of new levees particularly—by the action of river waves during storms, and the sinking, sliding or sloughing of the rear slope, when saturated with water during the first rise after it is built.

2. The perforation or honeycombing of an old levee by crawfish and perhaps—in some cases—by muskrats. Crawfish most abound where the ground is low and the levee high, where the damage they do is greatest.

3. The general neglect of levees after they are built and received from the contractor, and the notoriously imperfect manner in which contract work is done. The earth should be rolled, or rammed, or compacted by building with carts; it is generally only wheeled up in barrows, and, is therefore, as loose as it possibly can be.

4. The cutting of the levee by malicious persons, but principally by "swampees" or "timber getters," who require an overflow to enable them to float out the timber they have "deadened" during the low water season, generally on land which is public, or the property of others than themselves.

The levees built in Louisiana in 1866-7 by the Board of Levee Commissioners—nearly all of which failed—were of much larger dimensions than W. J. B. proposes. These had a river slope of four feet base to one foot rise, a rear slope of two feet base to one foot rise, and a width at the top equal to the hight.

The plan of timber piling, sheet piling or inclined planking proposed by me, is approved by some of the most experienced levee men here. It will meet all the difficulties stated above, and though expensive, perhaps, would prevent all failures of levees, and render practically impossible the occurrence of crevasses. Absolute security must be felt or capital will not again seek investment in the Mississippi Valley.

G. W. R. B.

A Plan for Ventilation.

MESSRS. EDITORS.—I have just read in your issue for July 27th, the article on ventilation taken from the London *Herald*, and will give you the idea which I have of the question: Let there be a trench dug and a pipe or flue built therein along the lines of a street or other public thoroughfare, one end—its mouth or receiving end—being at as low a point as attainable, where it may receive through its funnel-shaped mouth fresh air from off water or from the valley, and then pursue its course along to all the panting inhabitants and dust-covered goods upon its line. Let it be tapped as gas or water pipes are now, or somewhat similar thereto, and let it be under the care of trusty officers to see that it is not wasted in unoccupied buildings or parts of buildings that may once have used it.

There may be many or few of these pipes, as surface of water, or low ground presents itself or necessity requires. If demand is greater than space, the steam force-pump or fan may be employed to meet it.

The air, in passing through these pipes, would be cooled in summer and warmed in winter. Two highly prized conditions, and the latter one, of economy. Cities built upon hills, if of great elevation, would need but little or no assistance from the steam engine. Your city and surrounding cities might be abundantly supplied from your water surfaces. A mouth at the Battery might receive a large amount of pure, cool, fresh, and invigorating air, fresh from the sea. The mouth might be closed against the smoke of passing steamers by an ever-present watchman.

I must modify the terms "pure" and "fresh," so long as we continue in the lazy, filthy, disease-breeding and abominable practice of emptying our privies and sewers into running water, rather than to collect their contents and deodorize and use it in agriculture. They do this, and that too with large profits in England. But as long as this abomination remains the mouth or mouths of large enough flues might be placed, as is the head of the Croton Aqueduct, miles away, and in a section free of stench, smoke and dust. Would not this answer for the purpose of keeping our dwellings and fine goods and wares in a good degree free from dust, as inquired for by a correspondent of your paper a short time ago?

The air tube should be a tube within a tube, an open space being left entirely around it except enough of bearings for its support. T. E. G.

Erie, Pa.

Rotation of Forest Crops---Are Acorns Seeds?

MESSRS. EDITORS:—Are acorns the seed of oak trees? Will acorns sprout and grow into oaks? Wherever a pine forest is cut off, a growth of oak immediately follows, and as regularly as though the seed had been sown, although there was not a oak tree in the forest to produce seed before it was cleared. The question is often asked, do the oaks grow from seeds produced in the acorn, if so, how does this seed get in the clearing so regularly? Some say it is carried there by birds, but the kind of birds are not named that would be likely to distribute acorns; others think the acorn is not a seed but a fruit for the food of the wild animal, that oaks are spontaneous or grow from a certain inherent combination of matter of the earth that will produce, and one of the productions is the oak, the same with the chestnut and the walnut; neither reproduce from the nut. Please give the correct information upon the subject. FANNY.

Philadelphia, Pa.

[The succession of growth of forest trees in the circumstances named is well established, and does not affect the acorn question. There is no doubt that the acorn is a seed and contains the germ of the oak. "Tall oaks from little acorns grow."—EDS.

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Upsetting of Leaden Bullets.

Messrs. Editors.—Your correspondent of San Francisco, in your issue of August 3d, gives a very ingenious explanation of the cause of upsetting and fracture of bullets. Its only fault appears to be in its want of truth. The true cause, as I understand it, lies in the inertia of the metal forming the front portion of the bullet resisting the pressure of the rear portion. Of the truth of this I think your correspondent will be convinced if he will try the following experiment: Take a piece of heavy rifle barrel, say 4½ inches long, close one end securely, leaving four inches of bore, charge with two inches of best electric powder, then drive a tightly fitting steel plug half an inch long down to the powder, insert a loosely fitting soft leaden bullet long enough to fill the remainder of the bore, with the pointed portion outside, so that no confined air will oppose the bullet; fasten it to some heavy body to prevent recoil, and fire with a percussion cap, and the bullet will be found shortened and enlarged in diameter. The plug acts as a wad preventing leakage, and by its friction resisting pressure until the powder is burned.

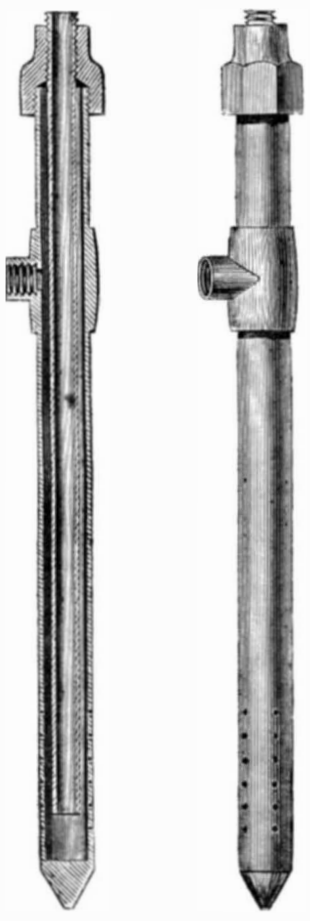
The experiment of the bullet on the anvil proves just nothing at all, as the pressure given by the bat is simply inadequate to produce sufficient velocity to upset the lead; the surface of wood in contact with the bullet yields to the pressure and thus the time is extended enough to move the bullet without change of form. If your correspondent will try again using a steel hammer of the same weight of the bullet and give the same power as before he will find the form of the bullet sensibly changed, simply because the motion was imparted in a shorter space of time.

Again in the second experiment. The principles involved when the bullet is placed on its point and struck, are entirely different from two opposing elastic gases. In this case one solid is placed between two other solids and pressure applied, a simple case of forging Where the principle applied is pressure exerted on a part of the surface at a time, it would be impossible to upset the bullet by the pressure of elastic gas alone, even if it should be condensed to equal the lead in density, as the pressure must be equal over the whole surface and in effect the same as placing it in a swage exactly fitting it and applying pressure, it would be condensed if porous, but not changed in form. S. H. Roper.

Roxbury, Mass.

DUTTON AND MAGUIRE'S PUMP TUBE.

The labor of digging a well is one requiring time and not unattended with danger, especially when the soil is of a yielding nature. And sometimes after the well has been dug and walled up, the inflowing of quicksand keeps the water in an impure state, and, if a pump is used, cuts the valves and destroys its efficiency. The invention herewith illustrated wholly obviates the necessity of digging a well, by merely driving a proper tube into the earth.



By the device shown in the engraving—the pipe in one case being a whole, and the other a section—it is shown that a stream of pure water can be lifted to the ordinary hight without the nuisance and trouble of the common pump-pipe. The outer or main pipe is armed at the bottom with a cone which penetrates the soil to the requisite depth, while the tube contains another pipe that only admits the water, pure and separated from gravel, sand, and other foreign matters.

The inner tube is whole and perfect, the only entrance to its interior being its bottom, while the outer tube is perforated at its lower end with holes which allow the passage of water, while their diameters do not permit the ingress of of gravel or sand.

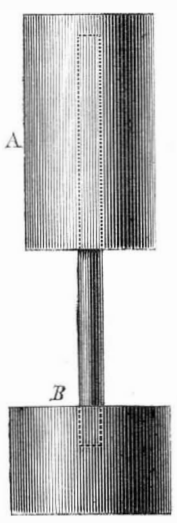
The result of this device is that while the inner tube allows the ingress of water, free from the sediment of sand or fine gravel, the outer one will yield the fluid, but in perhaps a less pure state. In fact, by the use of the side tap, shown in the engraving, water can be drawn from the outer pipe for outside purposes, while, for domestic uses, it can be drawn from the inner pipe in a state of purity not allowed by ordinary well or pumps.

The improvement seeks to prevent the rising of sand or gravel in the pump, and to prevent, by the combination of two tubes, the accumulation of sand in the pump tube or pipe by encasing the pump tube, proper, in a perforated pipe, which, while it gives ample ingress to the water, prevents the ingress of any body which may prevent the free action of the pump.

To those who have been annoyed by the use of pumps, which brought up as much soil or sand as water, this device will appear as an improvement. It was patented Oct. 10th, 1865, by Thomas Dutton and Thomas Maguire, of Port Jervis, N. Y., who may be addressed as above.

MANUFACTURE OF MAGNESIUM AND SODIUM.

Altogether, in the manufacture of sodium and magnesium an average number of twenty men and boys are employed in the works at Manchester, Eng. To make magnesium, one part of sodium is mixed with five parts of chloride of magnesium, the crucible is covered and heated to redness, and afterwards allowed to cool. The block thus produced is then broken up, and reveals lumps of crude magnesium metal in the form of eggs, nuts, granules, and minute buttons. The crude metal is then put in a crucible through which a tube rises to within an inch of the lid; the crucible is at first filled with the metal nearly up to the top of the tube. The pipe passes from the crucible, A, down through the furnace bars into the closed iron box, B. When the crucible is heated the magnesium distils over pure-like zinc, and descends into the box below, where, at the conclusion of the process, it is found in the form of a heap of drippings. It is subsequently melted, and may be cast into ingots or any required shape, although it is much easier rolled than cast into thin plates, being a somewhat awkward metal to work.



SODIUM.

Sodium is not only in common use in all laboratories, but the recent discovery of the method of manufacturing magnesium on a large scale, by the aid of sodium, has caused an excessively heavy commercial demand for the latter metal. Sodium is also used in the reduction of aluminum and other of the rarer metals. In consequence of the present large demand, it is now manufactured in England on a large scale, and almost exclusively by the Magnesium Metal Company, at Manchester; so that this remarkable metal, which threw Sir Humphrey Davy into ecstacies when he for the first time saw a few globules of it early in this century, has within the last few months been selling in London at a wholesale price of five shillings per pound avoirdupois.

Before describing the recent improvements by the Magnesium Metal Company in the manufacture of sodium, it may be as well to summarise some of its properties and applications. Its great affinity for oxygen and power of decomposing water without the aid of an acid are well known. Unlike potassium, it does not cause the gas evolved to take fire spontaneously, for this only occurs when there is so little water that the fragment cannot swim, or when the water is thickened with gum to prevent it from moving about. It is a light metal of the specific gravity of 0·972. Sodium is much valued by men of science, because the rapidity and length of the vibrations of its particles, when burning, are such that it throws out rays of pure monochromatic yellow light. This property is especially valuable to those philosophers who have occasionally to explain to large audiences the properties of light and the phenomena of spectrum analysis.

This month, chemically pure hydrate of soda, obtained by the direct action of water upon metal itself, has for the first time been introduced into the market. Chemists require this article in a very pure state foranalytical investigations; hence they will value the new hydrate of soda, which is necessarily free from silica, calcium, and other salts, which are commonly found in the hydrate of soda now used in analysis. The pure hydrate of soda is prepared by placing a single drop of distilled water in a deep semicircular silver vessel capable of holding about four gallons. Blocks of pure sodium are then cut into lumps, each about one and a half inch square, and one of these pieces is allowed to fall on the drop of water. The vessel, which rests upon a stream of cold water, is then agitated by hand to present a larger cold surface to the fusing sodium, and thus prevent explosion. Great heat is evolved during the combination, hence the necessity for the stream of cold water. The piece of sodium, now transformed into a a milky liquid, has other lumps of sodium and other drops of water successively added, with continual agitation, till several pounds of sodium have been used up. A thick residue, with only a few drops of milky liquid on the top, then remains in the silver vessel, which is next placed over a gas stove, the contents heated to redness to drive off the superfluous moisture, and the remaining hydrate of soda cast into any form required.

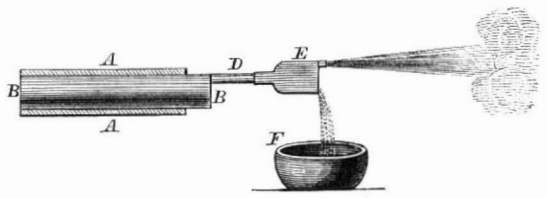
Mr. Crookes, F.R.S., has recently shown that an alloy of sodium and mercury, which he calls "sodium amalgam," can most advantageously be used in the extraction of the precious metals from their ores. Till recently, the miners used unalloyed mercury for the purpose, which answers well up to a certain point, but, after being ground up with the ore for a prolonged period, becomes what the miners call "sicklied," or incapable of acting further upon the ore. The addition of a small percentage of sodium renders the mercury much more active, but why it is so, is not clearly understood. In practice, however, the use of amalgam has been found more economical than the old process, and it has been suggested that the auriferous ores of Wales, which are too poor to be worked profitably at present, may be made to yield a good return by the use of sodium amalgam.

The explosive power of sodium, when brought under the necessary conditions into contact with water, renders it a somewhat dangerous substance to place in the hands of men unacquainted with its properties; but, when kept away from damp and wet, it is a very harmless metal. In the course of last winter the river Irwell rose nearly twenty feet above its ordinary level, and flooded the works of the Magnesium Metal Company, on the Salford side, to a depth of about seven feet in every part. There were then from three to four hundred weight of sodium in stock, and, soon after the commencement of the flood, the room in which the sodium was stored was two feet deep in water; but, as it rained in torrents, it was then considered best not to run the risk of attempting to move it off the premises. The sodium was stored in long narrow jars, with loosely-fitting covers, made air-tight by allowing the bottoms of the lids to rest in a circular groove filled with oil. As the flood did not abate, and the position began to grow more dangerous, one of the men volunteered to go on to the roof of the sodium shed and watch the water rise, and for hours he lay upon the roof in a soaking shower of rain, watching the sodium jars. Inch by inch the water rose, and at last, when it was only half a foot from the top of the jars, he drew his head out of the hole in the roof where it had been sticking so long and summoned the rest of the men. They unslated the roof of the store room, let themselves down into the water, now reaching nearly to their armpits, and removed the sodium, lump by lump, into other vessels placed among the rafters of the roof. By accident one little ingot of sodium fell into the water, causing the courage of the men to falter; but the lump, fortunately, only fumed and fizzed, and dissolved away without exploding.

In the manufacture of sodium the Magnesium Metal Company has devoted much attention to the construction of good furnaces, and to the adoption of effective measures for protecting the wrought-iron reducing retorts from the destructive effects of an exposure of seven or eight hours' duration to a white heat. The iron retorts are surrounded by plumbago jackets, which remain permanently in the furnace till they are used up. The openings of the plumbago tubes are in the sides of the furnace, so that the retorts can be easily placed in them and taken out. The retorts are of wrought-iron, since cast iron would yield to the excessive heat necessary for the reduction of sodium. The retorts are, in fact, iron tubes three feet six inches long and five inches in diameter. Both ends are plugged with wrought-iron stoppers, luted in with fire-clay; but one of the stoppers carries the tube to which the condenser is attached.

Each retort holds about thirty pounds of the "sodium mixture," which consists of coal, coke, chalk, and soda. The soda is first thoroughly dried at a high temperature, then all the four substances are separately ground to the finest dust, and afterwards they are mixed and ground together, as much of the success of the operation depends upon the thorough incorportion of the ingredients. These substances, when heated together, necessarily give off volumes of carbonic oxide and carbureted hydrogen, these gases, rushing out of the retort, do good service in acting as carriers to the sodium vapor.

In the cut, A A A A is the plumbago jacket inserted in the



heart of the fire, and B B the wrought-iron tube plugged at each end in the manner already described. D is the exit tube for the gas and vapor, and E the condenser. The condenser is broad and flat in shape, like a book, and is nine inches long, five inches deep, and one inch thick. In the end furthest from the furnace it has two slits, one above the other, each slit being one inch deep by three-eighths of an inch wide—the full width of the interior of the condenser. The necks of the condenser and the retort are accurately turned so as to fit well, but no luting is employed. When the apparatus is at work a long stream of ignited gas shoots out several feet from the upper orifice in the condenser; but the vapor of sodium partially condenses after leaving the retort, and the metal falls out of the lower orifice in a melted state, drop by drop, into the vessel, F, filled with an oil free from oxygen, and which has a very high point of ignition, to do away as much as possible with its tendency to catch fire during the distilling operations. The sodium is then run together beneath oil, over a slow fire, and then cast into rectangular blocks, or any other shape, for the market.

The entire operation lasts from six to eight hours, during the whole of which time the tubes are subjected to an intense white heat. Most of the furnaces contain four tubes, but one of them is a reverberatory furnace and holds eight. One man and three boys manage a furnace of four tubes. The boys are much occupied in the task of keeping the condensers from being choked by clearing them out as much as possible with hot iron rods inserted through the slits. Nevertheless the condensers have to be constantly changed, for some of them will not last longer than twenty minutes without getting choked. When choked, the condenser is taken off, thrown into water, its sides are then unscrewed, taken off, and cleaned, then fitted together again, ready for future operations. Altogether, the appliances on the premises are capable of turning out four or five hundred weight per week—a large amount considering the expense of the metal, and the fact that it is lighter than water, and consequently is bulky.—*British Journal of Photography.*

Test Objects for the Microscope.—To such wonderful perfection has this process been carried that M. Nobert, of Griefswald, in Prussia, has engraved lines upon glass so close together that upwards of eighty thousand would go in the space of an English inch. Several series of these lines were engraved upon one slip of glass. By these, the defining power of any object glass could be ascertained. As test objects they are equal to, and even rival, many natural objects which have hitherto been employed for this purpose. The delicate lines on some of the diatomaceæ are separated from each other by the 1-50,000 of an inch, while the finest lines engraved by M. Nobert a not more than the 1-100,000 of an inch apart.

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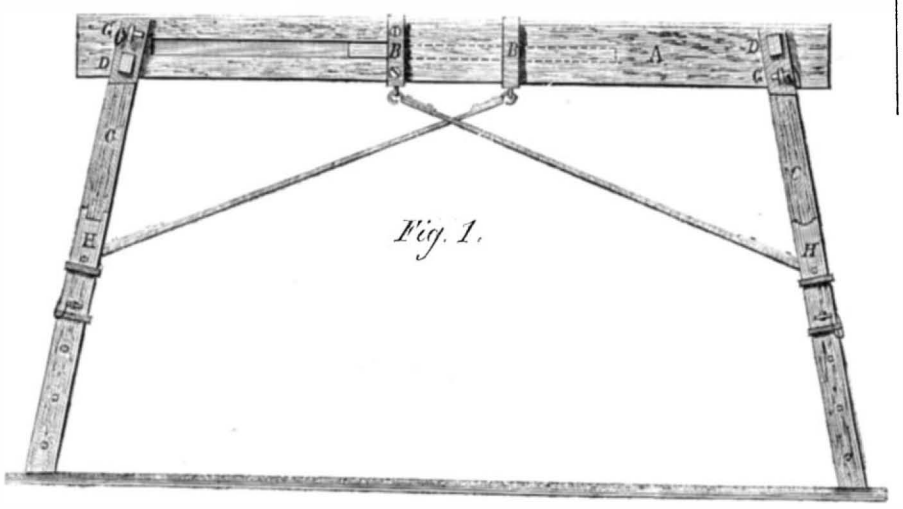
Improved Extension Trestle.

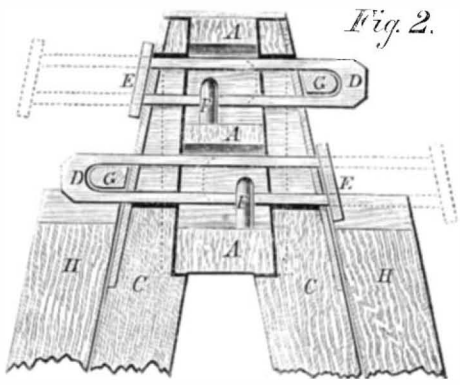
The object of the device shown in the engravings, in elevation and perspective, is to furnish a convenient trestle or horse for the use of masons, plasterers, and others, which can be extended in length and hight, or folded compactly together for transportation or stowage.

The main horizontal beam, A, is in two parallel parts, connected and held together by straps, B, one of which is fastened by screws to the inner end of each beam and surrounds the other, so that the two portions of the beam may be slipped, one past the other, for extending the length of the trestle. Between these two parallel parts is a bar or feather sliding in a groove, cut half in each portion of the beam and stayed by pins at its ends to prevent it from slipping entirely out. The object of the feather is to stiffen the beam when extended and to keep it perfectly in line.

At each end of the beam, A, are two legs, C, which are secured by means of slotted pins, D, Fig. 2, which are flat and have heads, E, inclined to the slant of the legs, C. The slot in these pins is to prevent them from being entirely withdrawn which is assured by the staples, F, fastened in the mortises through the beam, A, in which the pins, D, fit. The pins can be drawn back, as shown by the dotted lines, by removing the keys, G, when the legs or supports may be folded against the bar, A.

To these supports or legs are attached supplementary legs, H, in both figures, which are secured to the outside of the true legs by bands seen in Fig. 1. A series of holes through the extension leg and into the main leg secures the two, by pins, in any required position. Braces running diagonally from the rings, B, to cross braces between the legs, keep the structure in a rigid condition when in use.





HAMMILL'S EXTENSION TRESTLE OR HORSE FOR SUPPORTING PLATFORM.

The device was patented through the Scientific American Patent Agency, June 11, 1867, by Richard Hammill, of Mineral Point, Wis., who will answer all inquiries addressed to him relative to his improvement.

Improvement, and Usefulness of the Milling Machine.

It is doubtful if any tool now used by machinists is more valuable and capable of being applied to a greater variety of purposes than the milling machine, yet it has been a growth of comparatively a few years. Twenty years ago the milling machine, or rather the "slabbing machine," its progenitor, was seldom seen, and when found was constructed and used only for a special purpose. A pair of ways, on which traversed a platform or table, and from which rose two supports for a head that received an arbor with its rotary cutter, comprised the "slabber," and the work was fed to the milling tool by means of a weight and strap running over a friction wheel. It was a rude machine, coarsely made, and unreliable in its work; yet it was the germ of the present milling machine, one of the most expensive, best finished, and valuable of the machinist's tools.

For many uses it is better than the planer and superior to the shaping machine, and not seldom does the work of the gear cutter. The manufacture of fire arms, rifles and pistols, and of sewing machines could not be carried on so perfectly and rapidly without the milling machine. The cutting of ratchets, the squaring of studs, the finishing of nuts, scoring of taps and reamers, facing of surfaces, and a thousand and one other processes can be done with this machine quicker and better than with any other appliance used by the mechanic. When the machine works as it should, the article submitted to it comes out almost completely finished, without "chatter" marks, and smoother and more accurate on on the surface than is possible with the file, while its rapidity of execution puts to shame the most expert filer. We have seen the lock plates of fire arms so finely finished by this machine that it would seem to be a waste of endeavor and and time to do more than to polish them.

Some of those machines are of such perfection of workmanship, plan, and action that it would seem impossible to improve them. Their saving of files, and time, and labor, would hardly be believed by machinists who have never used them; and their easy adaptation to different jobs makes them one of the most economical machines ever constructed. And yet we are not aware that any man holds a patent on any essential portion of the machine; it has been the gradual growth of experience, one mechanic adding a part or improving a movement, and another improving again on that, until it would be assumption in any one to claim the machine perfected as his own.

Its value is such that a shop of any pretensions should as soon go without a decent screw-cutting engine lathe as without a good milling machine. There is no department of finished metal work where it cannot be advantageously used, and no matter how small the shop, or how contracted its influence, every manufacturer of machinery should possess a milling machine.

Aerial Navigation.

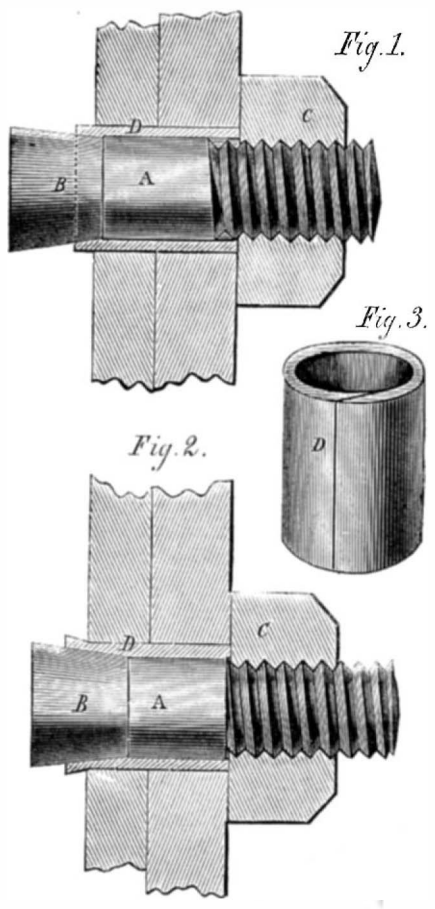
A stock company of San Francisco are building a flying machine which is described by papers of that section as resembling in appearance a hybrid between a fish and a short-necked bird with wings expanded. Hydrogen gas furfurnishes the ascensive power, the wings aid in sustaining it in mid air, and two propellers which may revolve at any angle, give motion to the machine. The rudder is like the tail of a fish, and to rise to any hight it is given a twist, the movable wings are depressed ten or twenty degrees and her propellers are placed at angles of forty-five degrees. Her weight including propellers, frame, engine of three horse power, boiler, furnace and fuel, is only 1,171 pounds, and in lightness and the application of steam power, rest the hopes of her projectors in success.

In M. de Louvrié's system of æronautics, which the Academy of Sciences have seen fit to disapprove, the recoil caused by a sudden expansion of gases as in the sky rocket, seems to have been made use of as a motor. This inventor provides a hollow cylinder which contains an explosive compound generated by the mixture of air with a highly inflammable gas formed from some volatile hydro-carbon, such as benzine or petroleum. The combined gases are lighted as they escape from a small orifice at the lower end of the cylinder and the resistance at the closed end from this explosion, causes the ascent. Of these explosions there are from thirty to forty per minute.

Just before the close of the war our government was induced to undertake the building of a flying machine constructed on what seemed the correct principle, namely, that of the flying top. Accordingly a huge ellipsoid of copper was constructed having three propellers, revolving in a horizontal plane above, and an equal number below. Although it, according to theory, ought to have ascended, the weight of the apparatus with its engine which was necessary to turn the propellers, was so great that the machine proved a failure, and it is now being broken up and sold as old metal at a heavy loss to the constructors.

CLARK'S COMBINED BOILER BOLT AND FERRULE.

Much difficulty is experienced in reparing boilers either by the ordinary rivets, or by screw bolts. Especially is this the case where the leak is near an angle or any abrupt connection of sheets with flues, etc. The use of red-hot bolts is attended often with considerable annoyance, and screw bolts are well known to be unreliable. The engraving represents a new style of bolt which posesses great advantages over the devices usually employed for the purpose. The bolt, A, has an "upset" or conical head, B, which prevents it from being drawn through the holes, in the plates by the tension of the nut, C. On the outside of the shank of the bolt, is slipped a ferrule, D, of steel which is expanded by the strain of the nut and the incline of the head so as to entirely fill the hole. Fig. 1 shows section of the two plates of a boiler with the bolt and ferrule passed into the hole, and Fig, 2 shows the bolt set up and the ferrule spread. Fig. 3 is the steel ferrule, which is split. The larger end or head of the bolt is smaller than the hole through the plates, and the ferrule is of external diameter suited to the hole, so that the bolt can be passed, head first, through the hole, the ferrule passed over the shank and into the hole, and the nut screwed on from the outside. The result will be as seen in Fig. 2. The cone shape of the head forces the ferrule out against the sides of the hole making a perfect joint. It will be noticed that with this bolt there is no necessity for cutting hand-holes to get at the point for repair, and no bother of "stringing" bolts. Beside, the nuisance of "soft patching" is wholly avoided. The friction of the bolt in the hole is such that even by turning up the nut with the fingers, the bolt will never turn in setting up. If deemed advisable, an outer ferrule of brass or copper can be used over the steel ferrule, which fills more easily the hole in the plates. If the hole is somewhat out of round, this may be found to be an advantage. Seams can be chipped and calked where made with this bolt as readily as though made with the ordinary rivet.



Letters patent were secured for this improvement April 24, 1866, and it has been thoroughly tested on a large number of boilers always with satisfactory results. Further information may be obtained by addressing the patentee, E, Clark, a practical boiler maker, at 80 New Chambers street. New York city.

ANOTHER PETROLEUM DISASTER. DANGER OF TRANSPORTING CRUDE PETROLEUM.

On the 20th of June the ship *Meteor* with 2,007 barrels of petroleum, stowed away in the hold left New York for London. On the morning of June 14th when she was about 300 miles from New York, the captain who was looking over the ship's side felt something strike him on his back with great force, instantly followed by a great noise. For an instant he supposed that some of the crew had shot him, but turning round he saw the whole of the deck blown away, immense volumes of flames shooting into the air, and the top-gallant sail on fire. Between him and the fore part of the vessel the deck was blown to atoms, the boats were reduced to match wood, while beneath his feet was exposed the whole of the hold, one mass of fire, raging like a volcano. Several of the crew were instantly prostrated and although they state they heard no sound, the explosion was heard on a ship twenty miles away. This is the begining of the fearful disaster of which we have the further details in the newspapers.

This case of the *Meteor* is by no means the first of the kind nor is it mysterious nor extraordinary. We have read a dozen cases quite as remarkable. Every one understands the nature of petroleum, and can give the reasonable explanation of what are called "accidents." The hold of a ship in which crude petroleum is stored in ordinary wooden barrels, has an atmosphere which is as ignitable and explosive as gunpowder. The barrels perspire the oil at every pore, and the vapor which steams away from their surfaces mingles with the air—the other element of the danger. Moreover this explosive compound being heavier than the air, remains in the hold of a ship as if corked in a bottle, and is ready at any moment of the voyage to blow the ship to atoms. A ship laden with petroleum is the most fearful of torpedoes. Gunpowder will stay in its barrel, and will be found where it has been stowed, but petroleum escapes from its confinement and seeks the fire.

We earnestly submit that the time has come when the destruction of life and property by crude petroleum should be ended. These disasters are preventable and we believe that no reasonable and legitimate commercial interest is promoted by their contiuuance. The simple and practicable prevention of the danger of petroleum is the entire prohibition of the transportation of crude oil. The volatile and dangerous part of petroleum is useful and needed at the wells where produced, and at no other place. Why send it to New York and Europe where no one wants it? If the oil business were rightly managed, refined oil could be sold at lower prices to consumers while the proprietors of wells and refineries might have a better profit for their investments. The whole force of legislation, national, state, and town, ought to be brought to bear against the transportation of crude petroleum.

THE DENTAL ART AND PRACTITIONERS.—Forty years ago surgeons and doctors generally officiated as teeth-pullers whenever occasion demanded. In 1820 there were but thirty practicing dentists in the United States. In 1850 the number had increased to 2,923, and at present there are about 5,000 regular dentists. A college for the education of those desiring to enter this profession, has been established over a year in this city, and the faculty of Harvard College, at their last Commencement, provided for a department of dentistry in connection with that university.

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Trial of Loughridge's Steam Brake for Railroads.

Some time ago we made a notice of a trial made with this contrivance on the New Jersey Central Railroad. Another trial was made August 1st at which we were unable to be present; we however subjoin a report, published in the *Evening Post*. The facts there stated are of great suggestiveness, and would seem to demonstrate the immense superiority of this method over that in ordinary use on the score of safety, not to speak of economy:—

"The brake is operated by a steam cylinder with 34-inch throw of piston. This cylinder is placed under "foot board" of the engine. Nothing is seen on the engineer's stand but a small lever that opens and shuts a valve, and a ¾-inch pipe through which the steam passes into the cylinder. A chain passes around, pulling on the piston head. This chain goes through the train, connected by sections of rods and chains, and the brakes are applied through the agency of small standards in the center of the car. By means of the safety valve in the brake cylinder, the steam escapes when the pressure becomes greater than required for the best braking. By this means the great evil to railroad economy—of sliding wheels—is obviated.

At a former test seven brakesmen exerted their full power at the brake-windlass, and the indicator showed the following difference:

A exerted power of	230
B	304
C	288
D	272
E	226
F	192
G, a beginner, exerted a power of	160

The steam brake showed a power of three thousand five hundred pounds. The same power was exerted at the last trial with the same result.

The following will show how quickly a train may be stopped at different velocities:

	Distance run in feet.	Time stopping in seconds.
When running at a speed of 56 miles to the hour, the train was brought to a state of rest from the point where the signal was given in	624	16
2d speed of train 32 miles per hour	408	16
3d speed of train 32 miles per hour	412	16
4th speed of train 24 miles per hour	250	16
5th speed of train 50 miles per hour	721	21
6th speed of train 50 miles per hour, hand brakes	1817	51

The engineers who have used it express their admiration of its use, and the engineer on the Central Railroad on the train on which the brake has been in use for seven months, says he will not hereafter run a train to which it is not attached. He can stop a train within two feet of any point designated at any rate of speed."

Internal Revenue Decision.

TREASURY DEPARTMENT, OFFICE INTERNAL REVENUE, WASHINGTON, July 23, 1867.

Sir: In reply to your letter of the 17th inst., this office would inform you that the special tax receipt of a patent-right dealer, covers the sale of patent-rights only, and does not permit him to deal in the patented article; and all persons who engage in the latter business must pay the special tax as commercial broker, peddler or dealer, either wholesale or retail, according to the manner or amount of sales.

Very respectfully,

E. A. ROLLINS, Commissioner.

AUSTIN H. BROWN, Collector Sixth District, Indianapolis, Ind.

Editorial Summary.

EXPLORATIONS.—Prof. Whitney, state geologist of California, is now engaged in a scientific exploration of Mount Hood and its vicinity. His report will probably settle the disputed right of this mountain to be called the highest peak in the country. Prof. Kellogg, the well-known and able botanist, has set sail, under a government appointment, to explore and report on the botany of the newly acquired territory of Alaska. The Central Pacific Railroad exploring expedition, under the leadership of Clarence R. King, is now surveying the belt of country between Virginia City, Montana, and Denver, Colorado, about 900 miles. Search will be particularly made for coal indications; the agricultural character and the flora and fauna of the country will be carefully noted. Three years are to be occupied in the survey. Mr. Samuel Adams, of Arizona, has had an interview with Secretary Stanton relative to a proposed expedition to discover how far the Colorado River is navigable. He proposes to start from Denver, the head waters of the Grand River, or from Fort Bridger, and proceed down the river in flatboats to Colille, at the mouth of the Colorado.

THE WESTERN HEGIRA.—The new towns which have sprung up, as by magic, on the line of the Pacific Railroad, disappear, some of them, as rapidly as they were created. The North Platte *Index*, June 25th, says:—"Our city is disappearing as it by some mighty feat of jugglery, and the busy scenes of trade have given way to the sound of the ax and hammer, tearing down houses and business places, which will soon be seen again eighty miles west of here, at Julesburg. Nearly every man who has been engaged in business here is going into business at Julesburg, and most of them on a much larger scale than here, and in one week from this time we shall see Julesburg a lively business town, larger than was North Platte! The next number of the *Index* will be published at Julesburg."

A NEW STYPTIC.—The *Antwerp Journal* says that the perchloride of iron combined with collodion is a good hæmostatic in the case of wounds, the bite of leeches, etc. To prepare it, one part of crystallized perchloride of iron is mixed with six parts of collodion. The perchloride of iron should be added gradually, and with care, otherwise such a quantity of heat will be generated as to cause the collodion to boil. The composition when well made is of a yellowish-red color, perfectly limpid, and produces on the skin a yellow pellicle, which retains great elasticity.

RAFT NONPAREIL.—The announcement of the arrival of this little raft at Southampton on the 26th of July, after a passage of forty-four days from New York, was hailed with much satisfaction. The *Nonpareil*, though she made tardy progress, experienced no mishap, and her captain, as well as her crew of two men, landed on a European shore in safety, health, and good spirits.

EXPLORATIONS IN PALESTINE.—The University of Oxford has made an appropriation of the sum of $2,500 for the purpose of equipping an expedition for scientific investigation in Palestine. Cambridge University will probably contribute an equal amount.

TIME REQUIRED FOR SEEING THE EXPOSITION.—To view the Paris Exhibition (according to an English writer's calculation), it is necessary to devote on an average five minutes to the glass case of each exhibitor. These number, it is stated, 45,000; it would, therefore, take 225,000 minutes, making 3,750 hours, or 156 days 6 hours; that is, 5 months, 6 days and 6 hours, reckoning 24 hours for each day. But as the interior of the place can only be visited from 10 o'clock in the morning till 6 in the evening, there are only 8 hours at the visitor's disposal instead of 24. One would therefore be occupied in the inspection 15 months, 18 days, 18 hours, supposing that he entered the building every day at 10 o'clock and did not leave it until 6. From this calculation it will be obvious that it is by no means possible to examine the whole of the exhibition during the period of its duration,

A TRAP TO CATCH SUNBEAMS.—In the optical room of the Conservatoire des Arts et Métiers, at Paris, near a window, are arranged several test tubes filled with powders bearing a written descriptive label by M. Becquerel. When the window is closed these powders exhibit in a most striking manner the phenomena of phosphorescence, each shining through the darkness with a different colored light. Under the name of the "Phoroscope," French makers are about introducing it as a new scientific toy. The London *Lancet* proposes the above name as a preferable one. Most of the powders are sulphides, and the brightest emanation is from the tube containing sulphide of barium. The phosphorescence may be induced by exposure to daylight for a few seconds, or to the light of burning magnesium wire.

MODEL COTTAGES.—It will be remembered that at the distribution of Exposition prizes, the French Emperor was awarded a medal for plans for erecting cheap houses for workingmen. Forty-eight cottages have been built in Paris after this model. Each house is three stories high, and each floor has two rooms and a small kitchen The buildings cost about $1,200 without the land; the total sum spent on these buildings and grounds has been 510,000 franes, and the whole has been presented by the Emperor to a Co-operative Society formed for the construction of cheap dwellings.

FRACTIONAL CURRENCY.—Early in the rebellion silver grew scarce, and to meet the demand for small "change," the Treasurer, General Spinner, caused two and a half millions of postage stamps to be struck off, supposing that this sum would fully supply all wants. There are now twenty-eight millions of fractional currency outstanding, and the revenue of the Post Office department is twelve millions. The new fractional note of the denomination of fifteen cents, soon to be issued, will have an engraved likeness of General Grant on the right hand, and on the left a likeness of Lieut. Gen. Sherman. The back of the note will be green, with the figure fifteen on each side.

THE POLLUTION OF STREAMS.—At the Salmon Fishery Congress recently held at Kensington, England, the secretary of the river Dee Fishery Board testified that since the establishment of a petroleum refinery on the banks of that river, every fish in the entire length of the stream, from salmon of 20 pounds downward, has been killed by a poisonous refuse matter which floats out from the refinery. The water supply for the town of Chester had been drawn from this river, but a skillful analyst has examined the fluid and declares that no filtration can purify water polluted by a poison so subtle and powerful as this.

POSTAL TREATY WITH GREAT BRITAIN.—This treaty, executed in London by Mr. Kasson, special commissioner in behalf of this country, and the Duke of Montrose, Postmaster General of England, provides for the transmission of letters not exceeding half an ounce in weight for twelve cents instead of twenty-four, as now charged. The same charge is to be made for every additional half ounce. International letters insufficiently paid for, are to be subjected to a fine of five cents in addition to the deficient postage, said fine to be retained by the government receiving the letter.

ANOTHER ARTIFICIAL FUEL, made in Glasgow, Scotland, is composed of one tun coal dust, 200 pounds of saw dust, and 40 gallons of heated coal tar, to which composition is added from 200 to 300 pounds of rock salt. By using hot tar the necessity for drying the fuel in ovens or otherwise is avoided. The novelty of this preparation seems to be the rock salt. No reason is given for its use, and as it does not burn, and would probably tend to disintegrate the lumps of fuel when put on the fire, we doubt the utility. Salt has however been used with fuel with the design of neutralizing the effect of sulphur.

SHAM CHAMPAGNE.—A joint-stock company with a capital of $20,000 has been doing an extensive business in San Francisco in manufacturing bogus champagne. The machinery for aerating and bottling the wine is said to have cost $5,000, and everything about the establishment has been provided on a similar scale. A suspension of operations has resulted from the arrest of an interested party on a charge of counterfeiting the labels of the genuine Clicquot and Heidsick brands.

KEEP A WRENCH AND USE IT.—Some one wisely says, to keep your wagons and carriages in good order, place a wrench on every nut at least once a month. This will save nuts, save bolts, and prevent rattling, wear and tear, and perhaps save from accident. There is a good deal depending upon looking after the running gears of vehicles as well as the harness. For want of a little attention much damage has been sustained.

TIN.—Immense deposits of tin are reported to have been discovered in Missouri. Hitherto the world has been compelled to rely mostly upon the mines of Cornwall for its ordinary supplies of this useful metal. A development of the Missouri mines will we trust enable us to produce enough for home manufacture, and may become an article of export.

THE BANANA.—A San Francisco paper announces the late importation to the market of the banana plant from Central America, with a view to its cultivation in California. The climate of some sections of that country is well adapted to its culture, and the experiment has every chance of success. The banana, it is said, furnishes more food to the acre than any crop capable of growth in a tropical climate.

GOLD FISH IN PLENTY.—The Hudson river has become so full of carp, or "gold fish," that fishermen take them by the wagon load. They originally came from a private fish pond near Washington's headquarters, at Newburg, which communicated with the river by an outlet, through which the fish made their way to the main stream. They have bred with great rapidity, and have stocked the river.

THE OPENING OF THE AMAZON RIVER to foreign navigation has been followed by a decree of the state of Bolivia, whereby the Madeira, one of the tributaries of the great river, is also opened to foreign trade. The Madeira with its branch, the Rio Grande, has a length of from 1,500 to 2,000 miles, for nearly 1,000 of which it is navigable.

AN ACCURATE TIMEPIECE.—We were shown the other day a watch made by a Liverpool firm, which had varied from standard time but seven seconds since the early part of last November. At this rate, if not regulated meanwhile, it would gain one minute in four years.

THE FRENCH GEOGRAPHICAL SOCIETY are about sending another exploring expedition to the Arctic regions for making scientific observations. The expense is to be borne by private contributions and the command is given to M. Lambert, a traveler of some note.

THE HUMAN BITE POISONOUS.—A French lieutenant was some time ago bitten in the thumb by a man with whom he was having an altercation. But a few days past and the wounded part became inflamed, the hand and arm began to swell, and death finally came to the relief of the sufferer's agonies.

A COMET was visible in the Sandwich Islands for some weeks last month. The Honolulu *Commercial Advertiser* describes its appearance as very faint, having a nebulous head (no star discernible in it), with a spreading tail eight or ten degrees in length.

A NORWEGIAN MONITOR called the *Scorpion*, just completed by the government, carries in a turret two Armstrong guns weighing 74,000 pounds. With a charge of 44 pounds of powder they throw 350-pound shot. The sides of the iron turret are eleven inches thick and are lined inside with horse hair.

NITRATE OF SILVER STAINS may be removed from the hands or clothing by the combination of tincture of iodine and a solution of hyposulphite of soda.

AN INGENIOUS BULLET DETECTOR.—A very ingenious piece of mechanism for the detection and extraction of bullets in wounds has been devised by Mr. Sylvan De Wilde. The probe, consisting of two steel wires insulated from each other, is connected with an electric horseshoe magnet and a bell, and when (introduced into the wound) it touches the bullet the circle is completed and the bell rings. The forceps act on the same principle, and are intended first to detect, then to seize, the bullet. They have curved points, and not pallets or spoons. The points of the probe are kept sheathed on introduction to a wound, and not uncovered until the supposed bullet is felt. This is effected by means of a sliding tube. Mr. De Wilde's probe is a sensitive artificial finger, which enters deeply into the tissues, and gives the signal at once when it detects the hidden source of mischief below.—*London Lancet.*

CRUDE PETROLEUM is said to be a powerful agent for the destruction of insects. A few ounces of petroleum diluted with water and sprinkled by means of a watering pot over strawberry plants, destroys the *maus*, or "white worm of the beetle." The oil mingled with a large proportion of water is a sure poison for crickets. The mixture is to be poured through a funnel into the holes frequented by them. The *acarus scabiei* is very promptly and radically destroyed by inunctions with the oil. Frictions with petroleum water cleanse domestic animals of the parasitic insects which annoy them. The animals should be washed with soapsuds a few minutes after the friction. It is also stated that a house infested with rats and mice was freed from these guests a little while after the introduction of a large quantity of the oil into the cellar,

THE ENGLISH BREWERS are one of the most important classes of the people of that country. Over $50,000,000 in taxes annually accrues to the government of Great Britain from this single interest. A startling assertion, in this connection, is made by a London medical journal to the effect that 50,000 pounds of *Cocculus Indicus* was imported from India to England. This substance is a bitter narcotic poison which is used simply to adulterate ale and porter. This same narcotic is employed by the natives of India to stupify fishes so that they can be easily caught. The amount imported, as given above, is a sufficient quantity to drug 120,000 tuns of beer.

PETROLEUM IN FRANCE.—Fresh discoveries of bituminous shales capable of yielding petroleum by distillation, are constantly being made in France, One of the most recently worked deposits is that of Vagnas, in Ardèche. which is really more of the "boghead" type than of the bituminous shale series. Its texture is dense and compact, resembling a carbonized and compressed peat. The peaty character is still further shown by the presence of a number of vegetable fibers, which may be seen with the naked eye, and which pass from the surface into the interior of the deposit. This substance yields about five per cent of the pure oil and a larger quantity of secondary products.

COLOCASIA.—This is the name given to a plant which is now attracting notice, from the curious observations which M. Lecoq has communicated to the Paris Academy concerning it. Without any apparent cause, the plant often exhibits a trembling motion, sometimes as many as 100 to 120 vibrations being noticed per minute. These undulations are strong enough to affect the neighboring plants, and even, it is asserted, have caused a similar motion in the flower pots. The only explanation offered, is that this is a remarkable instance of the direct transmission of solar heat and light into motion.

LIEBIG'S ARTIFICIAL MILK is manufactured on a large scale in England by an industrial company. It appears that Baron Liebig took as his basis the analysis of human milk, made many years ago by a German chemist. As the means of analysis at that day were not as perfect then as now, his results have been contested, and it is claimed by the Parisian Academy of Medicine that his artificial differs from the natural milk by its odor, taste, color, and chemical composition.

The great Exposition at Paris closes November 1st.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

The Rhode Island Locomotive works, of which company Gov. Burnside is president, have nearly completed their first years, operations. They now give employment to three hundred hands. Locomotives are built at their works weighing from eighteen to forty-five tuns.

The Croton Aqueduct Board are constructing a new reservoir for the purpose of keeping up a supply of water for Croton Lake. This reservoir is situated twenty-three and three-quarter miles above Croton Dam and seventy-five miles from this city. When completed it will cover an area of 303 acres, and have a capacity of 3,369,206,857 gallons.

The St. Petersburg and Moscow railroad, which a cable telegram informs us the Russian government has sold to private parties, has cost, including rolling stock, about $60,000,000, but the return realized upon this outlay has been at the rate of nearly 8 per cent per annum. In this connection it may be remarked that the chief English roads average but 5·27 per cent returns and six of the leading French roads 11·55 per cent. During the last six years the assistance afforded by the Russian government to the construction of railways in her possessions has been about $90,000,000.

The New Bedford glass company has recently begun to manufacture porcelain glass for photographic plates. They are blown in hollow cylinders four feet long, cut longitudinally, flattened in a furnace and cut into plates of the required size.

The East Bridgeport Metallic Cartridge Company employs 122 hands in the manufacture of copper cartridges. The daily product is about 100,000, part of the common kind, and part of the Berdan patent. The capacity of the works is soon to be made equal to the manufacture of 250,000 per day.

The largest grain elevator in the world is at Milwaukee, this one being 280 feet long, 80 feet wide and at present, 130 feet in hight, This immense structure weighing 10,000 tuns, is to be raised four feet. Its foundation has been cut with 400 holes for the insertion of timbers and 1,600 screws placed under these will furnish the necessary lifting power.

The total production of gold in Russia was estimated at nearly 23 tuns in 1864 and at a little more than 26 tuns in 1865. The State of California, during the year 1866 according to the best reports, produced 39·76 tuns of pure gold.

Work has been begun on the Milford Branch Railroad, and it will be completed in a few months. The Hartford and Erie road has offered to run the branch, giving the town and stockholders satisfactory terms.

The largest steamboat company in the country—the Atlantic and Mississippi line—have dissolved. A number of the best boats on the river were owned by the corporation, and since the war they have sought to establish a monopoly of the business. Their losses by fire—nearly $1,500,000—may have had something to do with the dissolution.

The New Haven building-block company are manufacturing patent brick having a long narrow slit, or air chamber, which they claim will keep buildings constructed therewith cooler in summer and warmer in winter than when built with ordinary brick. The bricks are made of a mixture of cement and shell lime.

The railway companies centering in Pittsburg have adopted a plan which might be imitated with good results elsewhere. They have selected skillful surgeons, whose special duty it will be to attend promptly and faithfully to all persons who may be injured on, or by, the cars in the running or management of their roads. The surgeons are to be paid for their services by the railway companies,

A valuable bed of umber, has been found at Ferdinand, Dubois County, Ind. The deposit is extensive and easily worked, and the quality excellent. Umber has hitherto been found only in very limited quantities in this country.

The projected railroad from Cordoba to Salta, Buenos Ayres, S. A., a distance of 700 miles is to be built by the same English company, that have just completed a road 130 miles long from Rosario to Cordoba. The report of the engineers represents the route as nearly a level, requiring but little if any heavy work in grading. It penetrates exhaustless deposits of pure salt, and the line will afford an outlet for copper mines rivaling in richness those of Lake Superior.

A new cotton factory, the first one ever built in the State, has just completed at Rockford, Illinois.

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Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

GRAIN-BINDING DEVICE.—George Warner, West Liberty, Iowa.—This invention relates to a new and improved grain-binding attachment to be applied to harvesters for the purpose of binding grain as it is cut.

DRAW HEAD FOR RAILROAD CARS.—Walter A. Shotwell, Paterson, N. J.—This invention relates to a new and improved draw head for railroad cars, and in a novel application of the draw head to the cars whereby the draw heads are rendered self-coupling, capable of being uncoupled or disconnected with facility, and also capable of being used when necessary, with the ordinary link coupling.

COTTON GIN.—Fones McCarthy, Orange Springs, Fla.—This invention relates to a new and improved gin for ginning Sea Island and other long staple cotton and is an improvement on what is known as the "McCarthy Gin," patented in 1840 and extended in 1854. The defect in this gin is this. The cotton is fed to the drawing cylinder on a plane horizontal grate, and is drawn in and held by the cylinder and breast plate while the stripper, so called, a rapidly-vibrating plate, strikes it (the cotton) and takes out the seeds. This stripper, which makes from six to eight hundred strokes per minute, strikes the seeds with such force that a great portion of them are driven above and fall upon the unginned cotton, and mingling with it greatly retard the ginning operation, making it necessary for the attendant to be constantly shaking and opening the cotton to get the seeds out of the way. By this improvement the cotton is presented to the cylinner vertically or nearly so down through a space between the feed board and a vibrating grate and the drawing cylinder, the seeds being prevented from rising by the cotton above them.

CORK RECEPTACLE FOR BOTTLES, ETC.—Alexander Honrath, New York City.—This invention consists in forming or making bottles, vials, and other small vessels for holding liquids and which are provided with cork stoppers, with a receptacle to hold a spare cork, to be used in the event of the cork in the nozzle or neck of the vessel being broken or injured in drawing it out; the receptacle being also convenient to place the cork in, when the same is drawn from the nozzle of the vessel, in order to fill the latter or pour the contents therefrom.

MACHINE FOR CUTTING FILES.—S. A. Sutton, Pawtucket, R. I.—This invention relates to a new and improved machine for cutting files and it consists in a novel means employed for adjusting the cutter relatively with the file blank, whereby the blank is cut uniformly throughout however round ing its faces or sides may be. The invention also consists in a means for regulating the force of the blow of the hammer so that the blow may be at all times commensurate with the length of the stroke of the hammer. The invention further consists in a novel arrangement of the cutter arm and bed, whereby the cutter is made to operate similar to a drawing cut, and perform its work in a thorough and efficient manner.

FRUIT PICKER.—Edward W. Gurnee, Haverstraw, N. Y.—This invention relates to a new and improved device for picking fruit from trees, and is designed to facilitate the tedious operation of direct picking by hand which involves the necessity of climbing trees and venturing out on small branches The object of the invention is to obtain a simple, cheap and durable implement for the purpose specified, and one which may be readily kept in repair and proper working order by any person of ordinary ability.

GANG PLOW.—D. C. Riggs, St. Joseph, Mo.—This invention relates to a new and improved gang plow and it consists in a novel and improved construction of the same whereby the plows may be readily raised out of the ground when required and the device placed under the complete control of the operator, while the plows arranged in connection with rotary cutters are made to operate with far greater facility than usual, and the draft of the machine thereby greatly reduced.

WINDLASS BEDSTEAD.—Joseph Horner, New Brunswick, N. J.—This invention relates to a new and improved mode of securing the sacking bottom to bedsteads, whereby said bottom may be very readily applied and detached, and, when applied, tightened up with the greatest facility.

SAW.—W. R. Stephenson, Transfer Station, Pa.—This invention relates to a new and useful improvement in circular and reciprocating saws, and it consists in providing the saws with teeth of peculiar construction and also with clearers, or scrapers, whereby a great saving of power is effected in the running of saws, and more work performed in a given time than can be done with the ordinary saws in use.

INSTRUMENT FOR STRETCHING BOOTS AND SHOES LENGTHWISE.—Wiley Jones, Norfolk, Va.—This invention relates to a new and useful improvement on an instrument for stretching boots and shoes lengthwise, and for which Letters Patent of the United States were granted to this inventor bearing date November 20, 1866. The original invention consists of a screw rod movable brace, and a shell or cap all so arranged that the brace may be adjusted within the boot or shoe against the counter thereof, and the shell or cap fitted in the toe of the boot or shoe and the longitudinal stretching produced by turning the screw rod. This instrument works perfectly in every spect but there is one difficulty attending its use, and that consists in the liability of the shell or cap to slip off from the end of the screw rod in adjusting the former into the boot or shoe, and the liability of the end of the screw rod being drawn out from the shell or cap in removing the instrument from the boot or shoe after the stretching of the same. The reason of this is owing to a lack of any attachment of the shell or cap to the screw rod, the latter having simply a tenon turned on its end to enter a hole in the shell or cap, a shoulder formed by the tenon bearing against the latter.

HORSE-POWER.—John C. Cox, Greenville, N. C.—This invention has for its object to furnish an improved horse-power for imparting motion to thrashers and other machines.

SLATE PENCIL SHARPENER AND HOLDER.—W. H. Alcorn, New York City.—This invention relates to a new attachment to school slates, and consists in an arrangement for holding and sharpening slate pencils, which is fixed to the slate frame so as to form part of the same. The holder is so made that it will be adapted to pencils of various diameters, while the sharpening device is made substantial and cannot be easily worn out.

APPLICATION OF ROWLOCKS TO BOATS.—Wm. Fuzzard, Chelsea, Mass.—This invention consists in applying rowlocks to boats in such a manner that instead of the rowlocks being fixed or stationary as hitherto, they will be allowed to move, under the action of the oars, in a direction towards and from the operator or oarsman while in the act of rowing, and thereby materially increase the length of the stroke, or sweep of the blade of the oars, and correspondingly augment the efficiency of the same in their propelling action.

COTTON CULTIVATOR.—Charles Gibbon, Hicksford, Va.—This invention relates to a new and improved machine for cultivating cotton, scraping the earth from the plants, thinning out the same, and throwing up fresh, loose earth thereto.

CLAMP FOR PAINT BRUSHES.—Geo. R. Gardiner, Westerly, R. I.—This invention relates to a new and improved clamp to be applied to paint brushes in order to confine the bristles so as to prevent an undue spreading of the same. The invention is designed as a substitute for, and an improvement upon the plan now adopted by painters to effect the same end, to wit, the wrapping of twine around the bristles, which is attended with considerable trouble, and after a brush has been used and worn down to a certain extent cannot be readily renewed and adapted to suit the length of the bristles.

PLATFORM SCALE.—Wm. W. Reynolds, Brandon, Vt.—This invention relates to a new and useful improvement in that class of platform scales which are provided with means for releasing the levers or weighing mechanism from the platform, when the articles to be weighed are placed upon, and after being weighed, taken off therefrom. This result is at present effected by having the weighing mechanism arranged in such a manner that it may, when it is necessary to detach or disconnect it from the platform, be lowered so that the latter will rest on the frame or bed of the scales, and hence scales of this class are commonly termed "platform drop scales." The invention consists in accomplishing the object by having supports connected with lever attachments, and arranged in such a manner that the supports, when it is necessary to relieve the weighing mechanism from the platform, may be raised so that the platform will rest upon them, leaving the weighing mechanism intact. By this means scales of this class are simplified in construction, rendered less liable to get out of repair, while all the advantages of the original plan are retained.

CAR COUPLING.—W. R. Jamison, Taylorstown, Pa.—This invention has for its object to furnish an improved car coupling, so constructed and arranged that should one or any number of cars be thrown from the track or fall through a bridge or trestle work, the cars will immediately uncouple themselves, but will be held securely connected in all other circumstances, even when passing around the shortest curves.

ROTARY HARROW.—P. B. B. Stiles, Galesburg, Ill.—This invention has for its object to furnish an improved rotating harrow so constructed and arranged as to be more easily operated, and more effective in operation than the harrows now in use.

FENCE.—F. W. Huxford, Boonesborough, Iowa.—This invention has for its object to furnish an improved fence for keeping the snow from drifting into cuts in railroads, and obstructing the track, and for other similar purposes.

CHURN.—C. J. Chalfant, Unionville, Pa.—This invention has for its object to furnish an improved churn, so constructed and arranged that the air may be carried down beneath the cream, and the cream carried up and thrown through the air, thus throwing the milk into violent agitation in contact with the air bringing the butter in a very short time.

NEW AND IMPROVED MODE OF APPLYING WINDOW SHADES TO WINDOWS.—H. J. Cox and Wallace Hill, Long Eddy, N. Y.—This invention relates to a new and improved mode of applying window shades to windows, whereby the former are rendered capable of being rolled up either from the top or bottom as required, and also rendered capable of adjustment laterally, and of being very readily applied to and detached from the window.

ECCENTRIC LATHE.—J. B. Gayle, Portsmouth, Va.—This invention consists in an arrangement which enables me to turn eccentrics for steam engines in a much more complete and perfect manner than it has hitherto been done, and the device is intended especially for that and similar purposes.

WASHING MACHINE.—Wellington Green, Kinzua, Pa.—This invention has for its object to furnish an improved washing machine so constructed and arranged as to do the washing quickly, and thoroughly, and with a small outlay of power.

FLOUR PACKER.—H. A. Barnard, Moline, Ill.—This invention has for its object to furnish an improved apparatus, by the use of which flour may be quickly, conveniently, and evenly packed into barrels.

CORN HUSKER.—H. N. Hill, Pontiac, Michigan.—This invention relates to an arrangement for cutting the ears of corn from the stem, and thereby cleaning the husks from the corn.

HAMES FOR HARNESSES.—S. G. Tufts, Maineville, Ohio.—This invention has for its object to strengthen the hame at its lower end, and to so construct the hame tug hook, that the hame tug may be readily attached and detached when required, and that it will at the same time hold the said hame tug securely in place.

BRUSH RACK.—John Ames, Lansingburgh, N. Y.—This invention relates to a new and improved rack for holding paint, varnish, and other similar brushes for exhibition in stores where the same are sold. Brushes have hitherto been attached to cards for this purpose, but they are very liable to become detached therefrom, especially large and heavy brushes, the invention consists in having a shallow box provided with one or more perforated cleats to receive the handles of the brushes and retain them in proper position within the box.

TUBE CLEANER AND WATER AGITATOR.—W. S. Stensby, Chicago, Ill.—This invention consists in arranging scrapers within the boiler and around the tubes which may be drawn back and forth from one end of the boiler to the other whereby the scale deposited on the tubes, and on the interior surface of the boiler is so loosened that it may be easily removed from the boiler by blowing off.

ANTI-FRICTION PUNCH AND SHEARS.—D. D. Robinson, Berrien, Mich.—This invention consists in so constructing a combined Punch and Shears that I am enabled to use a variety of punches and dies attached thereto and ready for use when moved into position, and also in the arrangement of gears for keeping the traversing rollers in position upon the inclined planes.

APPLICATION OF STEAM POWER.—A. J. Fullam, Springfield, Vt.—This invention consists in adapting steam power to operations which have hitherto been performed by hand, such for instance as drilling holes in the sides of ships, or in heavy machinery, of either wood or iron.

DOGS FOR DRAWING SAW LOGS.—Samuel Sykes, Chippewa Falls, Wis.—This improvement relates to the manner in which the "dog," which is driven with a saw log or other logs, for the purpose of a "hold fast," is formed.

MANGLE.—Henry Gransden, Dubuque, Iowa.—The object of this invention is to furnish a simple, cheap and durable machine, called a mangle, for smoothing linen; and the invention consists in placing in a suitable frame, rollers, between which the linen is made to pass under pressure.

OSCILLATING MARINE PROPELLER.—Charles E. Foley, Brooklyn, E. D. N. Y.—This invention consists in attaching to a shaft which passes through the side of a vessel, propelling wings, which are jointed or hung to a bar or bars which are attached to the shaft, and which stand at right angles therewith, the wings being hinged in pairs and operating against the water alternately.

FIRE KINDLER.—Henry Vanausdall, Keokuk, Iowa.—This invention consists in constructing an apparatus whereby oil, alcohol, or any of the hydrocarbons may be used for the purpose of igniting coal or wood.

MATCH SAFE.—P. Killin and H. C. Yates, Decatur, Ill.—The nature of this invention consists in forming a safe for holding lucifer matches of ordinary round or square forms, in which is an arrangement for discharging the matches from the bottom, one at a time, and lighting the match as it emerges from the safe or box.

HAY RAKE.—Charles Howard, Bearsville, Ulster County, N. Y.—This invention relates to an improvement in the construction of horse hay rakes, which consists in an arrangement of a lever for keeping the rake in position for raking, and triping it when loaded, so that it shall turn over and deposit its load to be instantly ready for going on with the operation of raking, and also of a lever for raising and lowering the rake head to clear the ground—and allow the rake to be moved from place to place without striking the teeth.

SAW MILL.—John C. Delavigne, New Orleans, La.—This invention relates to an improvement in a reciprocating saw mill, and consists in connecting the saw or saws with a walking beam to produce their motion in connection with springs, which are depressed by each end of the walking beam alternately, and reach to aid in lifting each end alternately.

COMPRESSING RATTAN.—Louis Klein, Dansville, N. Y.—This invention consists in compressing rattan to give it better properties as a substitute for whalebone.

PLANE FOR CUTTING BLIND SLATS.—James L. Bess and Adam Hagny, Keokuk, Iowa.—The subject of our invention is a hand plane, adapted to cut two or more thin slats for window shades, blinds, etc., at every stroke or movement, and at the same time dress or prepare the material for the operation.

CAR SEAT AND FOOT REST.—James R. Chiles, Richmond, Va.—The object of this invention is to provide a chair for use in railway passenger cars, which shall serve as a convenient and easy chair for sitting, or at the option of its occupant, be changed easily and quickly to a reclining chair.

METHOD OF PRESERVING WOODEN PILES.—W. Harrold Smith, Memphis, Tenn.—This invention consists in enveloping the pile with a hard earthen case, similar in composition and manufacture to common earthen or stone potter's ware. The earthen envelop may be glazed on its outer surface, and between it and the wooden pile the space is filled in with sand, concrete, lime, cement, coal tar, gravel or common earth. The object of the invention is to preserve piles and timber from decay, and from destruction by worms and insects.

REFRIGERATOR.—William Rosenkranz and Michael Esch, St. Paul, Minn.—This invention relates to a new device for cooling liquids in bottles, said device being so constructed that any one bottle can be easily taken out and replaced, and so that a constant stream of cold water is made to circulate in the apparatus.

EVAPORATOR AND DEFLECTOR FOR HOT-AIR REGISTER.—S. Hamilton Caughy, Baltimore, Md.—This device contains water, and is intended to be attached to the grating or register opening, so as to deflect the air into the apartment either against and around the tank, so as to evaporate the water freely or more directly into the room carrying less moisture.

WASHING MACHINE.—LeRoy Coville and William Keeler, Oxford, N. Y.—This invention relates to a washing machine in which a perforated board is arranged above the bottom of the suds box, which can be drawn out to allow the articles to be washed to be placed on it. A corrugated roller, which is secured to a reciprocating frame, that is connected with a rock shaft hung in the sides of the suds-box, is made to move across the aforesaid perforated board, and is pressed upon the clothes by means of springs, which are secured to the reciprocating frame, their tail ends working below a track fixed to the sides of the suds box.

MACHINE FOR MAKING SCHOOL SLATE FRAMES.—William Kester, Cherryville, Pa.—This invention relates to a machine which is used to saw, plane, bore, tongue, and groove, and join the pieces of wood which are used on school-slate frames. The invention consists in such an arrangement of the parts which compose the machine that the said frames can be made thereon from rough and unplaned boards, and be finished so as to be perfect and satisfactory, as regards their appearance, as well as their construction, strength and form.

COTTON PLOW.—C. Billups, Norfolk, Va.—In this invention the landside is provided with a vertical coulter, and is made detachable, and a new device is used for attaching and adjusting the scraper to the standard.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at 50 cents a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

W. H. C., of Mass.—Try paraffin for preserving your copper coins from the action of the air. Immerse them for a moment in melted paraffin and then wipe off the excess of paraffin with a clean, dry cloth.

J. M., of Pa., gives some information to watchmakers which will reply to several inquiries made of this office. He says: If watchmakers wish to experiment with compensation balances, isochronal hair springs, etc., they must not use the marine chronometer, but reduce the scale to that of a watch. The material of which the machine is made is as hard in small as in large scales of construction, while the pressure reduces with the scale, and the rubbing surfaces can be reduced in area proportionally to the pressure.

S. O. P., of N. Y.—The leather washers under the heads of carpet tacks are cut and placed by a simple machine operated by the foot. An upright punch comes down on a die and cuts the leather, while another punch, working inside the first, drives the tack through the leather. The tacks are placed in a hopper from which a tube, split through its bottom, conducts the tacks to the press the points hanging through the slot, the tacks being suspended by their heads. The best tacks for carpet purposes are those made from tough iron usually labeled "Swedish iron."

J. P., of Mo.—Zinc is not very tenacious. A wire of one-twelfth of an inch diameter will not sustain over 25 pounds.

T. W. H., of Mich., wishes to know how to purify and deodorize genuine crude bear's oil. Add to the oil ten per cent of its bulk of a weak solution of sal soda, and blow steam through the mixture for an hour or longer. Septimus Piesse however, says that the most popular and "original" bear's grease is simply hog's lard and almond oil prepared with oil of rose, etc.

H. P. J., of N. H.—"Which produces the most healthful heat for an ordinary room, an air-tight wood stove, an open wood stove, or a coal stove?" We are not aware that there is any difference in the nature or properties of heat, produced under different circumstances. Heat is always and invariably the same thing from whatever source it comes. There are, however, considerations relating to health for choosing between different methods of warming houses; as for example, ventilation, perfect combustion, and cleanliness.

R. J. H., of Mo.—You can make your floor tiles of any desired color by mixing with the clay the appropriate metallic oxides. Consult any book on coloring pottery or glass, and you will probably get all the information you need.

D. W. H., of Mich.—"How can I deodorize a pine-wood refrigerator or ice box? What solution or preparation applied to its internal surface will prevent it from imparting to articles of food placed in it the odor and flavor of pine?" The most effectual "preparation" and perhaps the best, is a lining of sheet zinc. No varnish would be wholly impervious to the fumes of the pine. If the box were thoroughly seasoned by exposure to the heat of the sun for a few weeks, probably the greater part of the volatile matter which constitutes the odor, would have been evaporated.

E. P. C., of N. Y., desires to know how to conduct the steam from his boilers, to an engine of 15 or 20 horse power, a distance of 100 feet without wasting his steam too much, and asks whether he should carry the pipe above or below the surface of the ground, how he should protect it etc? First, the pipe should be of generous area, say 3½ inches diameter, and should be covered with hair felting 2 inches thick, carried above ground for the convenience of detecting leaks, and protected from the weather. Properly protected the loss of steam from condensation would be hardly appreciable.

D. A. K., of R. I., asks if there is any trouble in burning pine shavings under tubular boilers of ordinary sized tubes; is there much gain of cylinder over tubular boilers; would an 18 or 20 feet boiler be more economical than a longer one; in a word, what is the best boiler for an establishment requiring 15 or 20 horse power? In reply we would say that, in our opinion, the best boiler for your use is the cylindrical tubular boiler, say four feet diameter, 10 feet long, with 50 three-inch tubes, and a grate surface of 18 feet. With a proper arrangement to admit air over the fire, through holes not over 3-16 of an inch diameter, the total area of which to be equal to 24 square inches, there is no reason why the boiler should not last as long as any ordinary cylinder boiler. The burning of pine shavings is perfectly feasible and is generally practiced in your section of the country.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

For Sale Cheap—Second-hand Barrel Stave Cutter and Jointer, full set of Shoe Peg Machinery, Portable Grist Mill, and new set of Spool Machinery. H. H. Frary & Co., Jonesville, Vt.

Pattern Letters and Figures to put on patterns for castings, etc., etc., are made by Knight Brothers, Seneca Falls, N. Y.

The owners of the patent step ladder illustrated in No. 5, present volume, offer for sale State and county rights on most favorable terms. Address Smith & Schenk, 183 Fulton street, Brooklyn, N. Y.

F. C. Beach, Stratford, Conn., wishes to communicate with parties who put down "drive wells" in that State.

"J. C. G." of Kansas (in July 27th No.) send address to A. Galpin, Neenah, Wis.

Steam Cooking and Heating Apparatus—Manufacturers of the above please address with descriptive price list, Lewis F. Hake, Salem, Columbiana county, Ohio.

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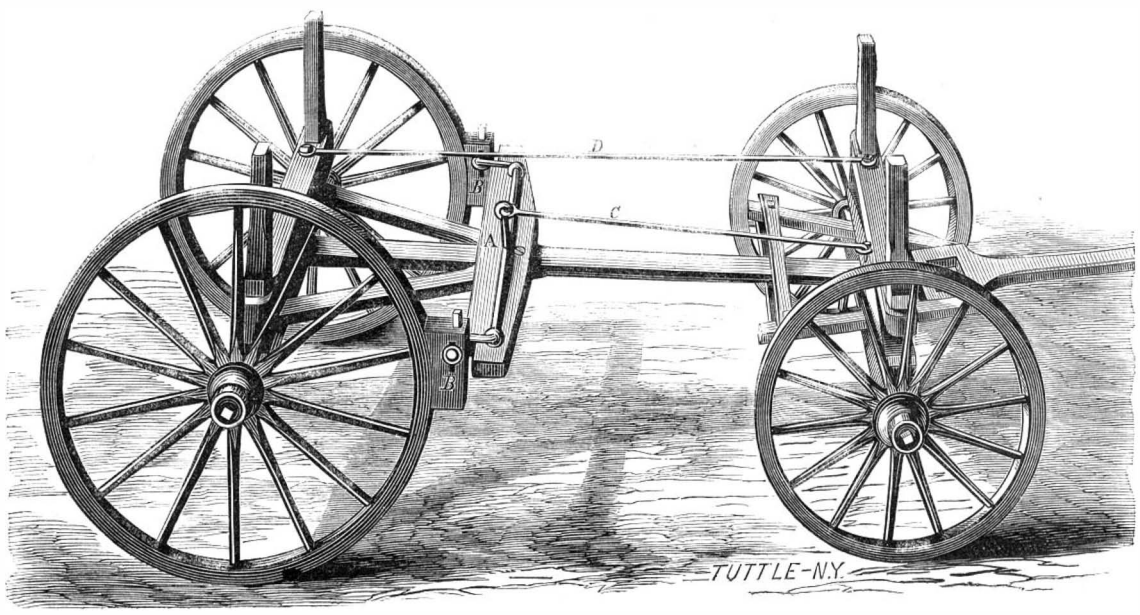
Improvement in Wagon Brakes.

It is a great relief to a team in descending an incline, as a hill, to have some means to release them from the pressure of the descending inertia of a loaded wagon. It is very hard on the horses in such a case to be compelled to secure their footing and at the same time to retain the pressure of the load. Such work is worse for a team than drawing a load up hill; as it is more straining and induces more or less of anxiety very dispiriting to the horses.

The object of the simple arrangement shown in the engraving is to provide an arrangement by which the wagon, itself shall afford the power, or, at least, designate the point for applying the brake. In the engraving the wheels, axles, bolsters, and uprights are the same as in any ordinary wagon. The reach, however, has a cross-piece, A, just in front of the hind wheels, which supports a bar formed, at each end into a bell crank, to which are hung the brake-blocks, B. The wrists of the cranks pass through slots in the blocks, in which they are adjusted by set-screws entering the tops of the blocks. The bar is pivoted to the cross-piece so as to turn in its bearings by means of an upright connected to one end of a rod, C, the other end of which is pivoted to the forward bolster on one side of its center. To the other end of the bolster is attached another rod, D, leading back to the hind bolster. This rod in the model merely represents the wagon body and is not necessary to the operation of the brake. The king bolt passes through the forward bolster and through a longitudinal slot in the forward end of the reach.



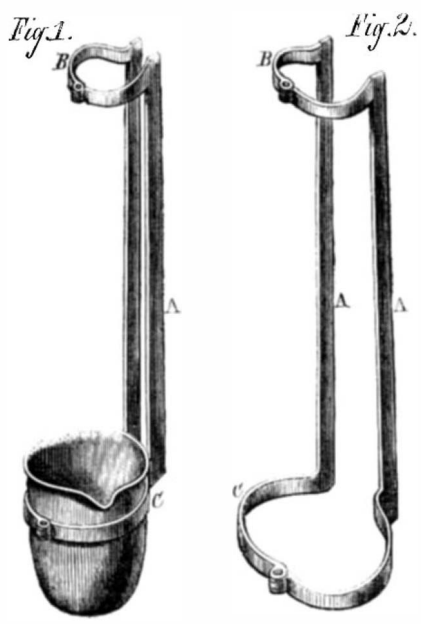
SMYTH'S IMPROVED SELF-ACTING BRAKE.

The operation is very simple. In holding back, the forward bolster is turned on the king bolt by means of the rod, D, or wagon body which acts as a fulcrum, while the forward axle and wheels are slightly backed, the reach sliding on the forward axle, and thus the rod, C, is made to push backward, and by turning the crank bar on A, forces the brake blocks against the wheels by a powerful leverage. The amount of force thus applied adapts itself exactly to the power exerted in holding back. When the team is pulling on a level the front axle is held forward, by which a reverse motion is effected and the brake blocks, or shoes, are lifted clear of the wheels. A friction roller is fitted into that end of the front bolster which passes under the wagon body when the team is descending a hill, in order to diminish the friction. The oblong perpendicular slots in the brake-blocks are to allow these blocks or shoes to be lifted by the backward rotation of the hind wheels when the team is backed. Thus it will be seen that under all circumstances the brake is self-operating and adjusting. It appears to be cheap, strong, efficient, and not liable to become deranged.

The contrivance was patented through the Scientific American Patent Agency, November 28, 1865, by C. A. Smyth. Rights for States, counties, or towns are for sale. For terms or other information, applicants should address Smyth & Parker, Independence, Jackson Co., Mo.

VILLARD'S CRUCIBLE TONGS.

The tongs seen in the accompaning illustration are in some measure adjustable, that is they will fit different sizes of crucibles, thus obviating the necessity of employing so large a



number of different sizes as are generally used in brass founderies, etc.

A, A, in both the figures, are bars of iron or steel, long enough to permit the pourer to use the crucible containing melted metal without discomfort from the heat. These bars are bent at each end into segments of circles, B, and C, nearly approaching semicircles, the length of the bars being perpendicular to the planes of the circles of which the segments are parts. The segments are hinged together, and those at one end of the tongs differ in diameter from those at the other end. Fig. 2 shows the tongs open, and Fig. 1 embracing a crucible. The elasticity of the bars when compressed by the hand will cramp the segments around a crucible with sufficient force to prevent it slipping in the tongs when canted to pour the metal.

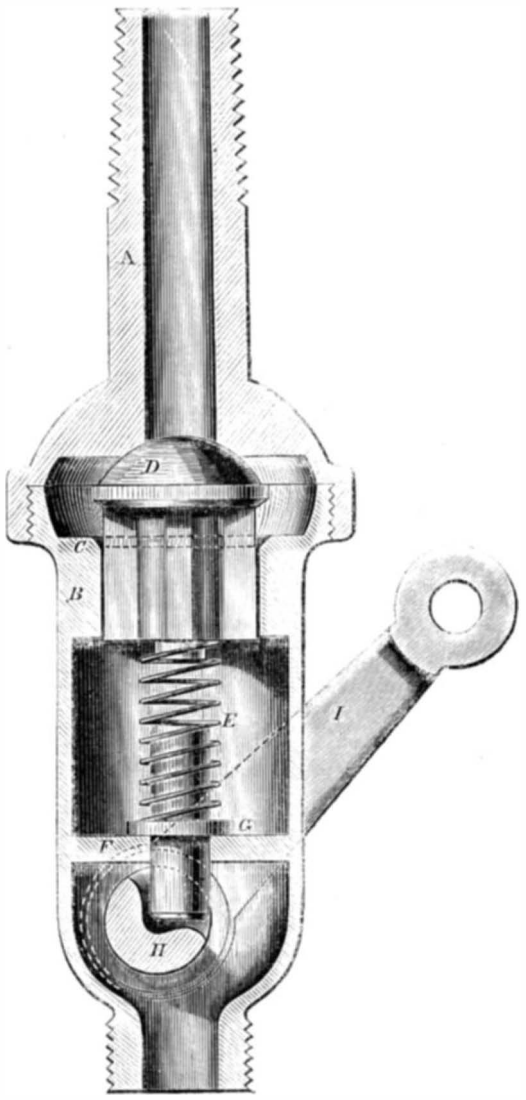
These tongs were patented through the Scientific American Patent Agency, Jan. 29, 1867, and have been sufficiently tested to prove their superiority. They can be made at small expense. For further particulars, address Fred. Villard, Mount Eaton, Wayne Co., Ohio.

Simple Mode of Preserving Eggs.

A correspondent, J. S. G., of Nassau, New Providence, Bahama Islands, sends us the following recipe for preserving eggs: "Smear with the finger the shell of a newly laid egg, using a slight quantity of butter. This is effectual; I have tried it for years and have, for experiment, kept eggs thus prepared as long as nine months, and that in a tropical climate, and at the end of that period the eggs appeared and tasted as fresh as though not more than a day old. It is a *sine qua non* that the eggs when buttered be perfectly fresh."

DAVEY'S STEAM TRAP.

Since the first introduction of the steam engine the importance of keeping the cylinders clean and free from condensed steam has been sensibly felt, and many ingenious devices have been applied for this purpose, but hitherto the disadvantages and objections have always been such as to materially detract from the real practical value of those improvements.



In the device herein represented it will be seen that there is little if anything to be desired more than is found in the actual working and capacity of this little trap.

The engraving represents a vertical section. A, is the stem which is screwed into the cylinder in the same manner as the ordinary cock, into which is screwed the lower portion of the trap, B, in which is the valve seat, C, of the valve, D, on the lower part and below the wings of which is the short stem which serves as a guide for the spiral spring E. Transversely across the chamber is the cross bar, F, which forms a seat and guide for the adjustable spring seat, G. Below this bar and guide is a faucet barrel into which is fitted a key secured in the usual manner; in the center of this key is cast a recess so as to form a cam or eccentric, H, as will be seen in the engraving. This key does not close the lower part of the trap, which is open at all times.

The operation of this trap will be readily understood; being screwed into the cylinder, the steam presses down and closes the valve, D, until the steam in that end of the cylinder "exhausts," when the valve immediately opens and allows the water to escape, thus leaving a continual opening in the cylinder, but without the escape of any steam; should it become necessary, the valve is raised by moving the handle, I.

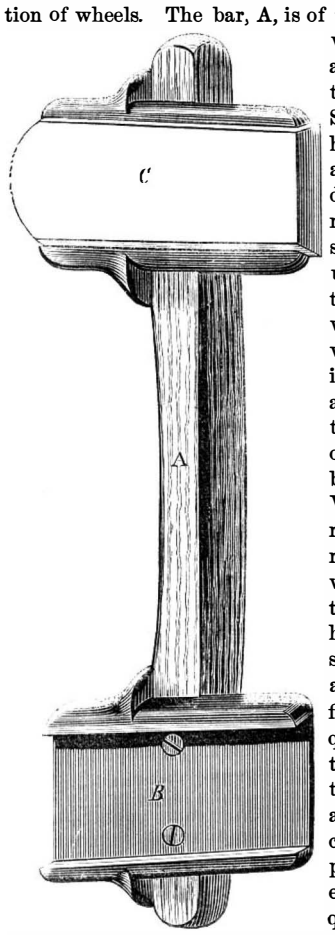
The advantages of this steam trap consist in instantly relieving the cylinders from water or other matter; allowing it no time to accumulate, but giving it egress at every stroke of the piston without loss of steam; in enabling the engineer to have full control of the apparatus, thereby permitting the raising of the valve if necessary, as is sometimes the case in the priming of the boilers and consequent flooding of the cylinders; or, as is often the case, when the cylinder cocks of a locomotive are far more effective in scaring cattle from the track than the bewildering effects of the whistle; and it can be placed in the same hole as the old cock without any alteration or other expense than the mere cost of the trap.

These traps are already adopted on several railroads in Ohio, Indiana, and Kentucky, also or stationary engines, where they are highly commended. The whole, or the right for the Eastern States, for sale. Address, Thos. N. Davey, Jeffersonville, Ind.

This trap can be used in any position, horizontal or vertical, and is not liable to get out of order. At all times the cylinders to which it is applied may be cleared of water or condensed steam. Patented through the Scientific American Patent Agency, Dec, 18, 1866.

KOCHENSPERGER'S BRAKE HOLDER.

The object of this improvement is simply to provide a proper and efficient seating for those wheel brakes where India-rubber, or some similar material is used as a resistant to the action of wheels. The bar, A, is of wrought or cast iron, or of wood, according to the situation it is to occupy, and the work it is to perform. Secured to its ends are the holders, B, for the resistants, these holders being dovetailed to receive the rubbers, one of which is shown at C. As commonly used, the brakes, or rather, the rubbers on brakes for wagons, cars, and other wheeled vehicles, are held in place by screws or bolts, and when they become worn they must be removed and others put in their places by means of similar bolts. With this, however, the rubber can be removed and replaced by another with very little expenditure of time. As will be seen, the holder is so formed that it slopes outward at the top to adapt the rubbers to the flare of the wheels; consequently, when cast, two patterns should be used, so as to make the holders rights and lefts. There is no necessity, when using this apparatus, to remove bolts, etc., and there can, consequently, be no trouble from loss of nuts or bolts.



Henry C. Kochensperger, of Thornville, Ohio, is the patentee, who may be addressed, as above, for additional information. The date of his patent is May 28, 1867. The entire right is for sale.

Benevolence Extraordinary.—A society has been formed in Germany for the collection of cigar ends, and smokers throughout Bavaria are appealed to for contributions of this kind, it being intended to apply the proceeds arising from their sale to the clothing of poor children. It is calculated that upward of £500,000 a year may be obtained by this means.

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Contents:

(Illustrated articles are marked with an asterisk.)

*Method of Raising Ice 97
*Method of Utilizing Heat in Steam Boilers 97
Soldering Iron and Steel 97
The Planets on Show 97
Editorial Correspondence 98
Transmission of Water Power for Long Distances 98
A Valuable Invention 99
River Embankments—Mississippi Levees 99
A Plan for Ventilation 99
Rotation of Forest Crops—Are Acorns Seeds? 99
Upsetting Leaden Bullets 100
*Dutton & Maguire's Pump Tube. 100
*Manufacture of Magnesium and Sodium 100
*Improved Extension Trestle 101
Improvement and Usefulness of the Milling Machine 101
Aerial Navigation 101
*Clark's Combined Boiler Bolt and Ferrule 101
Another Petroleum Disaster—Danger of Transporing Crude Petroleum 101
Trial of Loughridge's Steam Brake for Railroads 102
Editorial Summary 102
Manufacturing, Mining, and Railroad Items 102
Internal Revenue Decision 102
Recent American and Foreign Patents 103
Answers to Correspondents 103
*Improvement in Wagon Brakes.. 104
*Villard's Crucible Tongs 104
Simple Mode of Preserving Eggs.. 104
*Davey's Steam Trap 104
*Kochensperger's Brake Holder .. 104
The Duty of Usefulness—A Business for Every Man 105
A Uniform System of Coinage and the Proper Ratio of Values 105
The Metric System as a Branch of Education 105
The Cost of Artificial Light 105
Dangers of the Gas Made from the Volatile Constituents of Petroleum 105
The Metal Nickel—its Use in Coinage 106
Poisonous Character of So-called "California Rosewood" 106
Transplanting Trees—The Best Time and Way 106
Trial of Steam Fire Engines 106
Coal Gas Explosions 106
The Ailanthus 106
Patent Claims 106, 107, 108, 109, 110
*Improved Inclined Slat Bedstead 112
Bayonet Wounds 112

THE DUTY OF USEFULNESS---A BUSINESS FOR EVERY MAN.

There can be no surer evidence of the decay of a people than disinclination to useful labor and supercilious contempt of the laborer. That this disposition is growing among us is sufficiently evident from the efforts of our thinking men in their affirmations of the "dignity of labor," their protests against luxury, and their denunciations of the indecent haste to get rich, shown in the mania for speculation, which makes the needs of a nation and the food of the poor, objects of its unholy lust.

But it is not our intention to write a homily, but simply to speak a few words in truth and soberness on a subject that intimately concerns every young man for himself, and every citizen for his country. Except in a state of society where the producers are serfs, thralls, helots, or slaves it cannot be degrading to work. That citizens of a democratic republic should look upon labor as unworthy a man, is as certain a sign of the hollowness of our democratic pretensions as is the eagerness with which we accept the senseless decorations and titles bestowed by crowned heads. Industry is a virtue and not less a duty. The lazy man who could if he would, do a share of the labor which is necessary to comfort and luxury, and refuses because he has enough of the products of labor to live without producing, is an abortion not fitted for this working world. For him there should be a paradise of enforced idleness where he might vegetate in fungous luxuriance, undisturbed by the spade or hoe of active life.

If the examples of some of the most celebrated men are of any value whatever, their lives would show that the knowledge and practice of a useful profession did not detract from their fame. Take for instance the life of the apostle Paul. The only liberally educated man of the first apostles, having been brought up at the feet of Gamaliel, and the son of a Pharisee, himself a Pharisee of the "most straitest sect," which corresponds to the L. L. D. and D. D. of our style, yet he was not ashamed to work at his trade as a tent maker. Has a man lived since his day who has exerted more influence on the progress of the race? Probably not; and yet while we do not claim that his occupation and trade as a tent maker made him what he was, we do claim that neither his knowledge nor practice of his craft militated against his success as a reformer.

But apart from the low considerations of present profit and the higher ones of future notoriety, there is a duty which every human being is bound to respect. If labor is not the normal condition of the race it is imperative on us now. Allowing that we are in a transition from idleness (or rather laziness), through the ordeal of labor to the Utopia where all we need shall come fully prepared to our hands, this transition state demands action.

But the normal and the proper condition of the human race is one of work, and it would not be difficult to prove that this condition of labor, as a price for enjoyment, is the divine law as well as the most effectual means of human happiness. There can be no more saddening sight than that of a man without an object in life except to compass his own personal enjoyment. No man purely selfish can be happy. The grand element of happiness is the consciousness that we are contributing to the comfort of others. He who lives for himself alone, from the contributions of others, misses some of the most exquisite enjoyments of life. This is not mere talk but God's eternal truth.

In a country like ours, where nature presents to us thousands of opportunities, it is worse than neglectful to refuse to contribute our share in their improvement. The father who refuses or neglects to give his son a personal independence by furnishing him with a practical knowledge of a useful occupation, condemns him to a life of dependence and trouble than which death itself would be preferable. It is not necessary in all cases that he should be a farmer or a mechanic; the labor of the brain is as useful as that of the muscle, but the young man should be taught to labor either with muscle or brain. That brain labor is more honorable than that of the hands is a nonsensical notion, unworthy such a race as that which has for its mission the subjugation of a continent. The farmer and the mechanic—if they perform well their parts—are not only as useful but fully as honorable as the minister, the lawyer, physician, or editor. In every case labor is the price of success and the road to power, and in all cases that labor is a benefit to the world we live in.

A UNIFORM SYSTEM OF COINAGE AND THE PROPER RATIO OF VALUES.

The idea of a universal language has been for centuries a dream, or rather a prophetic inspiration of some of the foremost thinkers of the race; for there is nothing impossible in the idea nor improbable in its fulfillment. But human progress is by steps—or gradations—one thing at a time—and before we can welcome the beginning of an approach to a common language expressive of ideas which compass all the subjects upon which the human mind exerts itself, we must be content if we can see an agreement in a common method of interpretation on one single subject, that of money. If the love of money is the root of all evil, its proper use is the life of all progress, and whatever may facilitate that use is worthy attention.

A system of international currency has been proposed, and a convention agreed upon by the leading nations of continental Europe has recommended such a change in the value of the different national coins as shall make them, their divisions, and multiplies, interchangeable without loss. It is not proposed to change the name or character of the present coins in use by the people of different nations, but only to equalize their values. The proposition of the convention is to adopt the French Napoleon as the unit of standard for gold, probably from the fact that it already circulates without difficulty all over the continent and is largely current in Asia and Africa. The standard of fineness established by the United States government is common also to at least eight gold coins in foreign countries. The difference in value at present is very trifling between five American dollars, one English sovereign, twenty-five French francs, five German rixthalers, one hundred Spanish reals, five Brazilian milreis, and five dollars of the Central and South American States; so the difficulty of equalizing coins of the different nations is reduced to very small limits. The English sovereign, if reduced in value only four cents, would be of the same worth as twenty-five francs, and the American dollar would have to be reduced a little over three cents to conform to the five francs of France.

The equalization of values thus assured, the numerical relation of the different coins one to another would seem to present no great difficulty. Notwithstanding the apparent advantages of some other systems, it would seem that none possess so many good points with so few objectionable features as the decimal. Lord Overstone advocates twelve as a standard of division and multiplication, and Mr. Nystrom sixteen on account of its susceptibility of binary division; but it is evident that in either case other representative characters must be added to our present system of notation, which would for a long time prevent the adoption of such a system. Moreover, the manifest advantages of the French decimal system of weights and measures and its very general and increasing use, as well as the partial introduction of the decimal system of coinage in other countries beside the United States, would seem to designate this as the proper base for divisions and multiplies of value. We presume it cannot be successfully disputed that our system of money is superior in convenience to that of any other nation. It follows the system of notation in use throughout the world, and gives less trouble to the foreigner than that of any other country. If a common system of coinage be generally adopted for facilitating monetary exchanges we sincerely hope that the decimal basis will also be employed to determine the relations of the coins.

THE METRIC SYSTEM AS A BRANCH OF EDUCATION.

The Congress assembled in Paris in connection with the Universal Exposition, for the purpose of considering the feasibility of selecting and recommending some system of weights, coins and measures, which if adopted, shall be uniform among all nations, have submitted their official report relative to units of measure and weight. In substance, the commission recommend the prompt substitution for the old system, of the metric system in all its integrity, and as it is practically adopted in several of the Western European nations. "This system," they say, "introduced and legalized optionally, cannot be at once rendered imperative to the exclusion of every other system. A certain delay is necessary for the change; and the different nations are alone capable of fixing its duration. Let us observe in the meantime that experience in several countries has proved that a too long delay does not have the effect of sensibly facilitating the accomplishment of this task. Thus it is desirable that Governments take, henceforth, the following measures, viz:—

"1. To order the teaching of the metric system in public schools, and to require that it should form part of the public examinations.

"2. To introduce its use into scientific publications, in public statistics, in postal arrangements, in the custom houses, and other branches of Government administration.

"3. The commission does not consider, as appertaining to its mission, the duty of making standards the exact prototypes of those of Paris. The Government of each country will take upon itself the verification of each of these standards.

"The commission declares that the present report contains the expression of its deliberations and conclusions. It expresses a wish that different nations will yield to the solicitations of science and the manifestations of opinion."

Responsive to the first recommendation of the Commission we notice that in our own state the metric system of weights and measures has recently received a new and powerful impetus. At a recent meeting of the Teachers' Association of the State of New York, after an able discussion of the subject it was concluded that the system should be taught in the common schools and academies of the State. We understand that text books adapted to the system have been under preparation, and will be ready for use at the beginning of the next academic year. Several of the colleges also have added the metrical system to the ordinary subjects of examination for matriculation. If these plans are faithfully carried out, the final abolition of our present incongruous weights and measures is near at hand.

We suggest that the subject is already worthy the attention of business men—manufacturers and tradesmen. Are there not places already where the new weights or measures may be profitably employed? Is there not some article of commerce that may be advantageously prepared in accordance with the new scale? At any rate, some mathematical instrument maker will do well to prepare for sale, models of the new measures and weights. A metrical pocket rule, in our opinion, would prove a very lucrative manufacturing enterprise.

The American people are proverbially quick of apprehension, and if the subject be zealously agitated, the reform might be completed in a year. The metric system only needs to be explained to be appreciated, and with us the appreciation of a good thing is almost equivalent to its adoption.

THE COST OF ARTIFICIAL LIGHT.

The extortions and other sins of the gas companies are always popular subjects for contemplation and newspaper articles. These corporations are supposed to be conscienceless and inexorable; their voracity is never tempered by the slightest mingling of mercy for their miserable and powerless victims. Yet, seeing that we cannot help ourselves by bad temper, it is well occasionally to consider if there be not some advantage or comfort to be extracted out of the tyranny. We always advise to "give the devil his due," and we can afford to be as generous to the gas companies. Are we willing to give up the use of gas? What is the cost of gas compared with other illuminating materials?

Estimates of the relative cost of illuminating materials have often been made, and as prices are constantly fluctuating, they are always in order; the latest estimates of course will be most valuable. Prof. Edward Frankland has recently delivered a course of lectures before the Royal Institution of Great Britain, and from his sixth lecture we extract the following table. The prices in the original are given in shillings and pence, and these we have reduced to dollars and cents by assuming one penny as equal to three cents:—

COMPARATIVE COST *of the Light of* 20 *Sperm Candles, each burning for* 10 *hours, at the rate of* 120 *grains per hour.*

Wax	$2 59	Cannel Gas	$0 09
Spermaceti	2 40	Paraffin	1 38
Tallow	96	Paraffin Oil	18
Sperm Oil	66	Petroleum	23
Coal Gas	12½		

This table is based on the commercial rates of London. But the American prices are not materially different, and do not show any safe escape from the tyranny of the gas companies.

DANGERS OF THE GAS MADE FROM THE VOLATILE CONSTITUENTS OF PETROLEUM.

The volatile elements of petroleum called naphtha, gasoline, benzine, etc., offer such ready means for the manufacture of illuminating gas that attention has been naturally drawn to them as a cheaper material, involving less expense for apparatus and less labor for manufacture than the production of gas from coal or other substances. The extreme inflammability and readiness to explode at not excessive temperatures makes naphtha, benzine, or gasoline exceedingly dangerous substances. The lighter portions of petroleum are now largely employed for the generation of illuminating gas in isolated situations, where the ordinary gasworks are not convenient, and the ease with which the gas can be produced from the liquid serves to recommend its use.

That this substance is dangerous and cannot be made safe by the means usually employed and the care usually exercised is proved by repeated catastrophes. The latest is an explosion near Gloucester, Mass., July 29th, by which several persons were dreadfully and one at least fatally injured. The facts are, that at the date mentioned a fire was discovered in a house belonging to a gentleman whose residence was about two miles from the town, the fire being in the basement where was located an apparatus for generating gas from naphtha. An explosion occurred by which a number of firemen were dreadfully injured, one dying the next day, some so burned that recovery is impossible, and others dreadfully disfigured.

It would seem that no better direction can be given to the scientific and inventive talent of the country than attention to the properties and treatment of petroleum and its constituents, and devices for their safe manipulation and use.

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THE METAL NICKEL---ITS USE IN COINAGE.

The people of this country have become somewhat familiarized with the name of the metal known as nickel from its employment in the composition of our lower class of coins. Indeed, our "lame duck" cents—so called from the abortive effigy of a flying eagle, resembling a duck flying—are denominated "nickels" from the known fact that nickel forms an important part of their composition. While the intention of the government in the coining of gold and silver is to give value for value received, and thus keep the intrinsic value of the coins as a bar against the use or export of the precious metals, except as coin, those coins composed of pure copper or copper with alloys were never intended to represent, by their weight and composition merely, the value of the metals employed. Such was, however, nearly the case years ago, when a copper cent was about one sixteenth or one twentieth the weight of a pound of copper when that metal was worth from 25 to 30 cents per pound; but our pure copper two cent pieces, less than one half the weight of an old fashioned cent, bear now no proper relation to the market value of copper.

Still, the object has been to keep our lower valued coins somewhere near the market price of the metals of which they are composed, and at the same time to prevent them from becoming inconveniently large; so nickel was introduced as a composition of our cents in order to reduce their size while preserving their value.

Nickle is a brilliant, ductile, and malleable metal discovered by Cronstedt in 1751. It is found associated with cobalt and with iron in the ore, and is a common constituent of meteoric iron. The usual sources of supply are the arseniurets of nickle in cobalt and in what the Germans *Kupfernickel* or copper-nickel, containing 56 per cent of arsenic and 44 per cent of nickel. Nickel is found in Saxony, Thuringia, Hesse, Styria, Dauphiné, and in Sweden. In this country its ores are found at Chatham, Conn., and in Lancaster, Pa., or rather about fourteen miles from the latter place; from which most of that used in the government mints is obtained.

Our nickel cents contain 88 parts copper and 12 nickel. It has been used for coinage also in Bavaria. It is valuable as an ingredient of the alloy known as German silver, the best of which is made of nickel, 3 parts; zinc, 3½; copper, 8. The Chinese *tutenag* also contains nickel, although often regarded as zinc. The *pakfong* of the East Indies is also a composition of which nickel forms a part. Nickel is more fusible than iron, and like iron is rendered still more so by combination with carbon. It is magnetic at ordinary temperatures. Owing to its freedom from oxidation in ordinary atmospheric temperatures it has been used for the needles of compasses. It appears to have some marked points of resemblance to iron.

POISONOUS CHARACTER OF SO-CALLED "CALIFORNIA ROSEWOOD."

We are aware that some trees in a state of growth are poisonous, but entertained the belief that when cut down and seasoned no injury could arise from their use; but our faith is now shaken by the assurance of one of our subscribers that he has frequently had his hands and face poisoned when turning the so-called "California rosewood."

This wood is of a more brilliant red than Brazilian rosewood, and very handsomely grained with dark lines; its texture is however, closer than rosewood, and it resembles in that respect, as well as in its agreeable odor when worked, the red cedar.

We wish some botanical reader of the SCIENTIFIC AMERICAN in California would investigate the subject and give us the result. Occasionally parcels of this wood arrive by sailing vessels from San Francisco at this port and are purchased by the dealers in fancy woods. A beautiful specimen of this wood is on our table, and from the end of it a piece was cut and turned by our informant to make an ear ring. This piece did not weigh an ounce, but the dust from it while it was being turned settled on the back of both hands and on the wrists of the turner. Not having used this kind of wood for some months he had forgotten to take the precaution of wearing a leather glove. The day was warm and perspiration extended over the hands, allowing the dust to lodge on them.

The effect was similar to nettle rash; the back of the hands and wrists became like those of a child with scarlatina, and the itching so intense that it kept him awake almost all of the night. This effect had invariably attended the turning of the wood when no precaution had been taken to guard the hands. Some one of our chemical friends might like to analyse the specimen on our table and give the benefit of his skill to our readers.

TRANSPLANTING TREES---THE BEST TIME AND WAY.

For most trees, especially fruit trees, no time is more propitious for transplanting than the autumn. If the leaves are green they may be either growing, or not yet in process of decay; the difference between these two stages must be determined by experience and a knowledge of the nature of the tree. The state of the soil and weather is a much more important matter than the condition of the trees. The time should not be chosen in the tempests of the late autumn nor the rains of the late summer. In the one case the newly transplanted trees may be strained, the roots loosened from the soil, and so injured or laid open to injury from mice and mold as to effectually kill them; and in the other the heavy rains may produce the same result. Yet trees *can* be transplanted at almost any time, as has been done in London and Paris at the World's exhibitions, where full grown trees have been borne from one locality to another without injury or any apparent detriment to their growth.

If growing and full-leaved, the leaves ought to be taken from the twigs, otherwise the rapid evaporation of moisture from the roots by means of these lungs will certainly kill them. By the first of October in the northern sections of the country our fruit trees have ceased growing—such as cherries, plums, pears, etc. If the leaves are removed they may be transplanted without injury.

But the soil to which they are transplanted should be mellow, friable, and fine, so that it can be sifted well in among the roots and leave no interstices for water, frost, or mice. The roots should also be well covered and the stems buried to a depth of one or perhaps too feet, with a mound covering the roots, to be removed in the spring.

TRIAL OF STEAM FIRE ENGINES.

On Tuesday last we were present at a competitive trial of two steam engines manufactured the one by the Amoskeag Company, of Manchester, N. H., the other by the Gould Machine Company, of Newark, N. J. The trial was under the direction of the Metropolitan Fire Department of this city, and was undertaken to test the value of the claims for superiority made by the makers of the latter engine.

The Amoskeag steamer, *Metropolitan*, has a cylinder eight inches diameter, twelve inches stroke. The Gould engine has a cylinder seven and one-half inches in diameter, and ten inches stroke. The manufacturers assert that by their improvement in introducing two more pumps than are ordinarily employed, one of their second-class engines will throw a greater amount, and more streams of water, than a first-class steamer of other makers.

In the first trial for rapidity in generating steam, the engines were practically on a par. Both were then supplied with two hundred and fifty feet of hose, to which was attached a one and one-eight inch nozzle. The streams were thrown nearly equal distance, the Amoskeag perhaps throwing a few feet further than her opponent, her steam and water gages showing at the same time a pressure of eighty and one hundred and sixty pounds, to fifty-five and one hundred and forty pounds respectively of the Gould engine. In the second test, but fifty feet of hose was used and with an open butt of two and one-half inches. The steam from the Gould engine was now thrown much further than the Amoskeag. Even when the former engine was partially disabled by breaking one of the four patent division pumps, its superiority in throwing a greater volume of water was very evident.

The last test was forcing a stream of water through one thousand feet of hose with the nozzles first used, attached. The result showed that the Gould engine with one pump working with ninety pounds of steam and two hundred and twenty of water pressure, could throw water to a distance of one hundred and forty eight feet. Her competitor with one hundred and sixty pounds steam, and two hundred and twenty-five pounds water, threw a stream one hundred and fifty-four feet.

The hose used on this occasion stood a very severe test, and satisfactorily demonstrated its great strength above that made of leather. This rubber hose, patented through this office by Messrs. Perry and Torrey, has a filling of duck cut in strips and so wound that the warp threads of the fabric will cross each other at right angles. It stands a water pressure of over three hundred and fifty pounds without bursting, and the water never oozes through to the outside. This hose has been adopted by the fire departments of this and other cities on account of its superior strength and durability.

Coal Gas Explosions.

When coal is stored in bulk in a confined space, highly explosive gases are given off which may accumulate and on being ignited cause the destruction of the confining structure. This catastrophe frequently happens on board vessels freighted with bituminous coal, and the provision should always be made, as we intimated in an article bearing on this subject some months since, for thoroughly ventilating the hold of all vessels engaged in the coal-carrying trade. The latest accident of this kind reported occurred on board the English screw steamship *Conservator* on a passage from Sunderland, bound for London. The cargo consisted chiefly of dust coal, and the gas appears to have been set on fire by a naked light that was burning in, the forecastle. The lamp, it appears further, was purposely placed there under the supposition that it would consume the coal gas as it arose from the hold. With what success it accomplished its purpose, three of the crew who were severely injured by the explosion, can best testify.

The Ailanthus.

There is a great hue and cry throughout the West just now against the Ailanthus; but a writer in the Cincinnati *Times* thus defends it: "The Ailanthus tree is a native of the northern provinces of China, brought from there in 1750. The tree will grow in any soil, and to a large size where scarcely any other tree will grow at all. It grows so rapidly that it may be cut down for fuel every fourth year. As fuel, the wood is superior to that of most other trees; for open fires I prefer it to any other wood. It makes a clear, bright flame, and throws out a great deal of heat. Its charcoal is of a superior quality, and its ashes rich in potash. Its wood burns well when green, and every branch and limb may be cut into stove wood, leaving no brush on the ground. The wood is hard and of a fine grain, and well fitted for cabinet making. Sooner or later our farmers must grow wood for fuel and for cabinet making, and the Ailanthus tree offers itself as the most available tree for that purpose.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JULY 30, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

67,155.—EAVES TROUGH, BRACKET, AND CORNICE.—John N. Ball, Buffalo, N. Y.

I claim a combined cornice, eave trough, and brackets, A B D, as a new article of manufacture, constructed and used in the manner substantially as described.

67,156.—CLOTHES-LINE FASTENING.—Samuel A. Barr, Pittsburgh, Pa.

I claim the within-described clothes-line fastener, as a new article of manufacture, consisting of a plate, A, with perforated lugs, B B, cast upon it, which receive a pin, C, through their perforations, and having, also, a recess formed between, and perforated ears, outside of said lugs, as and for the purpose specified.

67,157.—PLANE FOR CUTTING BLIND SLATS.—J. L. Bess and Adam Hagny, Keokuk, Iowa.

We claim the arrangement of the slitting cutters, E E E1, edge cutters, D D, and swing cutters, C, in a frame, A A1, expansible by means of set screws, G G, all as herein described and for the purpose specified.

67,158.—HOOP SKIRTS.—F. A. Brewster, Springfield, Mass.

I claim, 1st, The springs extending from the tape, b, around the skirt to the tape, b1, in combination with the bands, a, and one or more semi-elliptical springs, d, the whole constructed substantially as and for the purpose set forth.

2d, In a hoop skirt, divided wholly or partially down the front, I claim the auxilia y ribs, or tie springs, f f, applied and operating substantially as and for the purpose herein set forth.

67,159.—CARPET STRETCHER AND TACK DRIVER.—W. Brown, New York City.

1st, I claim the combination of the inclined carpet stretcher with the vertical column and tack-driving apparatus, arranged and operating in the manner and for the purposes described.

2d, The combination of the tack-conducting tube and the cord and pullies, with the inclined shaft and vertical column, arranged and operating in the manner and for the purposes described.

67,160.—RELAY MAGNET.—Walter G. Brownson, Wellsville, Ohio.

I claim the use of one or more adjusting or counter-balance magnets, W, in combination with the armature lever, K, of a telegraphic relay instrument, and its receiving magnet or magnets, A, when said adjusting magnet or magnets are excited simultaneously with the receiving magnet, by the same electrical current, the whole operating substantially in the manner and for the purpose set forth.

67,161.—GAS-PIPE JOINTS.—C. Bruss, Jr., Worcester, Mass.

1st, I claim the combination of the tubular stem, B, and grooved disk or plate, A, with the corresponding grooved cap, I, and its tubular stem, C, under the arrangement and for operation as set forth.

2d, The combination with the concentrically grooved plates or disks, applied to each other as described, of the valve and its spindle, mounted and arranged in the joint, in the manner herein shown and described.

67,162.—UMBRELLA.—Chas. O. Buell, Stamford, Ct.

I claim the combination with the flange of the runner or crown piece of an umbrella, of a washer so arranged as to enclose between said flange and washer the rings or wires that hold the folding parts of the structure, substantially as described.

67,163.—PORTABLE WRITING AND COPYING CASE.—A. G. Buzby, Philadelphia, Pa.

1st, I claim a copying book having a case or receptacle in one of its boards or covers, as and for the purpose described.

2d, The strip, e, having a recess and elastic band, g, for the confinement of an ink stand and pen, as set forth.

67,164.—SHEEP SHEARS.—Geo. W. Carpenter (assignor to himself and Samuel Williams), Northville, Mich.

I claim the combination of the narrow blade, A, with the crooked brace, B, and the addition of the thumb plate, C.

67,165.—CAR SEATS.—J. R. Chiles, Richmond, Va.

1st, I claim the brace, I, in combination with the double joint, L, substantially as and for the purpose described.

2d, The combination and arrangement of the chair back, B, the joint, S, the cushion seat, M, and the roller, m, substantially as and for the purpose described.

3d, The foot rest, P, fixed to a ratchet bar, which slides in a socket beneath the seat, and supported by resting on the floor of the car, substantially as described.

67,166.—CALENDAR CLOCK.—C. M. Clinton and L. Mood, Ithaca, N. Y.

1st, We claim the construction and use of the clutch cog wheel, E, when made of the several parts, and in the manner described, for the purpose of its combined use with, and means of motion of the thirty-one, or other similar wheel of a calendar clock, thereby preventing the motion of the said wheel or wheels from being affected, or the said wheel or wheels from being misplaced by the position of the clock, as described.

2d, We claim the specific combination of the cross bar, F, clutch wheel, E, held in place by its spring, I, with beveled teeth, controlled and held by the stud, J, the same making a whole, and acting on the wheel, B, or its substantial equivalent, as described.

3d, We claim balancing the cross bar, F, so that the motive power of the calendar shall be in the rod, c, and not in any use of the cross bar as a weight lever.

4th, We claim the specific device of the tumbler, M, attached to any part of the cross bar, F, and acting by an elbow joint or lifting action on the stop, D, as described.

5th. We claim the projection, L, from the stop, D, for the purpose of a point of action on the stop, D, by the tumbler, M, as described.

6th, We claim regulating the action of the tumbler, M, by the stud, O, when virtually made and acting as described.

7th, We claim the combination of the wheel, B, the stop, D, projection, L, tumbler, M, stud, O, and cross bar, F, or equivalents thereunto, the same making a whole, and being constructed and operated as described, thereby preventing the motion of the wheel, B, or similar wheel, from being affected, or the wheel itself from being misplaced by the position of the clock, as set forth.

67,167.—EYE GLASS.—Geo. N. Cummings, Providence, R. I.

I claim the employment or use of the Guides, E E, when operated in the manner and for the purposes set forth.

67,168.—SEEDING MACHINE.—Herman V. Davis, Amherst, and George E. Smith, Blakeville, N. H., assignor to George E. Smith.

1st, I claim the seed box or hopper, D, mounted upon the vibrating lever, C, and operated from wheel, B, in the manner substantially as described.

2d, The vibrating hopper, arranged and operating as described, in combination with the funnel-shaped seed run or discharge opening, substantially as described.

3d, The vibrating hopper, provided with discharge openings of different sizes, and arranged to turn upon a center pivot, as described.

67,169.—KNIFE CLEANER.—C. F. Dean (assignor to himself and John S. Parker), St. Johnsbury, Vt.

I claim the combination and arrangement of the presser, C, and its screw, E, with the box, A, and its elastic lips, substantially as described.

I also claim the combination of the spring, D, with the presser, C, its screw, E, and the box, A, having elastic lips as described.

I also claim the combination of the slide, B, and the grooves, s s, with the box, A, the presser, C, and its strip of leather, d, applied to an india-rubber cylinder, c, or its equivalent, the whole being arranged substantially as specified.

67,170.—EMBALMING AND PRESERVING DEAD BODIES.—E. de la Granja (assignor to himself and Herman Susmann), Boston, Mass.

1st, I claim the preparation above described for injection into the veins and arteries, substantially as specified.

2d, The preparation above described for filling the cavities of the head, chest, and abdomen, substantially as specified.

3d, The process of preserving dead bodies above described.

67,171.—MOLD FOR CASTING INGOTS.—Henry Dickinson, Jersey City, N. J.

I claim the above-described construction and arrangement of a mold for casting steel and other ingots, substantially as and for the purposes set forth.

67,172.—PORTABLE OVEN FOR DRYING FRUITS.—George Diffenderfer, Lewisburgh, Pa.

I claim a double-wall portable fruit drier which is adapted for application to a stove in place of a portion of the stove pipe, and which is constructed and strengthened, substantially as described.

67,173.—CULTIVATOR.—W. A. and C. E. Dryden, Monmouth, Ill.

1st, We claim the frame, a a, in connection with the extended braces, b b, substantially as described and for the purpose set forth.

2d, The slotted axle, in combination with frame, a a, and seat pieces, h h, for the purpose set forth and substantially as described.

3d, The sliding seat piece, k, in combination with pieces, h h, for the purpose set forth.

4th, The vertical adjustment of seat, as described.

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5th, The arrangement of pieces, y y w w and x, for giving circular motion, substantially as described.

6th, The slotted fulcrum, in combination with the frame, a a, for the purpose set forth an substantially as described.

67,174.—WATER WHEEL.—Robert Dunbar, Buffalo, N. Y.

1st, I claim the rim, F, connected with, and extending downwardly from the plate, K, on a circle of less diameter than the hub of the wheel so as to form, in combination with the plate, K, and stationary disk, E, the lesser annular chamber, G, and in combination with the hub, the larger annular chamber, J, for the purposes and substantially as described.

2d, The holes, j1, in the plate, K, opening a communication between the chambers, M and N, through the annular chamber, J, substantially as shown and described.

67,175.—WATER WHEEL.—Robert Dunbar, Buffalo, N. Y.

1st, I claim a hub made flaring in the upper part thereof, as represented at A, in combination with the forward inclination of the bucket, in connection therewith, for the purposes and substantially as set forth.

2d, I claim giving a plane surface to the lower part of the face of the bucket of said wheel, lying between the cylindrical part of the hub and the anti-friction band, D, substantially as described.

67,176.—MACHINE FOR RAKING AND LOADING HAY.—W. A. Duncan, Syracuse, N Y. Antedated July 13, 1867.

1st, I claim the rake bar, O, suspended by the standards, N, from the draw bar, J2, hung by the adjustable rods, K, on hooks, L, in combination with link pieces, R, pivoted at one end to the projecting arms, T, of the draw bar, J 2, and at the other end to the projecting arms, S, of the rake bar, O, substantially as described for the purpose specified.

2d, The clearer board, D3, attached to the extension arms, E3, and gatherer board, F2, hung from the triangular frame, G2, all secured to the frame, A, when arranged to operate together substantially as described for the purpose specified.

67,177.—APPARATUS FOR EXHIBITING HYMNS, ETC.—H. V. Edmond, Norwich, Ct.

I claim the arrangement of the winding rollers, B C, apron, D, and friction rollers, I J, substantially as shown and described for the purpose described.

67,178.—HARNESS.—Henry L. Eshelman, Elizabethtown, Pa.

I claim the arrangement of the double segments or curved cross pieces, K K1, in combination with the adjustable pole, O P, and hinged side pieces or beams, B B1 and C C1, in the manner and for the purpose specified.

67,179.—THREAD CONTROLLER FOR SEWING MACHINES.—G. A. Fairfield, Hartford, Ct.

I claim a thread controller consisting of a lever and connecting bar, arranged substantially as herein described and for the purpose herein set forth.

67,180.—BROOM HEAD.—D. P. Farnham, Janesville, Wis. Antedated July 15, 1867.

I claim, 1st, The combination and arrangement of the handle, A, cap, B, and the clamp, D, secured to the cap, and operated by the screws, C C, that have their threads working into each other when the whole are constructed, arranged, and used in connection with the proceeds of winding or covering the ends of the corn, substantially as and for the purpose set forth.

2d, The combination and arrangement of the handle, A, cap, B, and clamps, D and E, operated by the screws, C and F, when the whole are constructed and used substantially as and for the purpose set forth.

67,181.—MOLDS FOR CASTING METALS.—J. Farrar and Wm. Groves, Providence, R. I.

We claim the combination, in any flask for casting the above-named articles, of the outer case, A, the flanges, a a, the coarse inner lining, B, composed of certain suitable materials, as set forth, and a finer grained lining, C, composed of another combination of materials to be mixed and applied, substantially as described.

67,182.—ROUGE PAD.—Harriet M. Fish, New York City.

1st, I claim uniting or combining with a soft cotton or other suitable fabric, a solution consisting of the afore-mentioned ingredients, without intending to confine myself to the proportions thereof as therein given.

2d, The manufacture of a rouge pad by uniting or combining with a soft cotton or other suitable fabric, a coloring matter, consisting of the above-mentioned ingredients, or their equivalents for this purpose, substantially as described.

67,183.—RUFFLING ATTACHMENT FOR SEWING MACHINES.—Mary T. Fitch, Lockport, N. Y.

I claim the combination of the weight H, cord E, bearing g, and hook f, or equivalent, substantially as and for the purpose set forth.

I also claim in combination therewith the roller S, arranged and operating substantially in the manner and for the purpose specified.

I also claim the special combination of the spiral spring p, washer o, friction rings n, nut and set screw q r, and loose pulley g, with the weight H, cord E, hook f, and roller, S, the whole arranged and operating as described.

67,184.—METHOD OF ORNAMENTING TIN, ETC.—Louis Fitzmaier (assignor to Atwater, Benham & Co.), New York City.

I claim, 1st. Ironing prepared paper on its back side by means of a hot plating iron for the purpose of obtaining a straight and glossy appearance of the same, substantially in the manner and for the purpose described.

2d, The use of a composition consisting of lithographic varnish and chrome yellow, substantially in the manner and for the purpose described.

3d, Rolling over the moist side of the paper by a wooden, flannel-covered hand roller, whereby a uniform impression of the drawing is produced on the tin, etc., substantially as described.

67,185.—COFFEE GENERATOR.—C. Fobes, Whitewater, Wis.

I claim, as a new article of manufacture, a coffee generator constructed as described.

67,186.—SPRING FOR BEDS AND LOUNGES.—Francis Fraps (assignor to himself and B. C. English), Sprinfield, Mass.

I claim a spring for beds, lounges, etc., formed of wire a, wrapped around a cylinder b, so that a loop extends out from each side at an angle, the ends of the wire being inserted in the ends of the cylinders, substantially as described.

67,187.—ADJUSTING TIRES TO WHEELS.—W. J. Garland and N. Morgan, Winchester, Ill.

We claim the arrangement of the tire D D', with its lugs E and F, screw a-bolt b, and slot c, substantially as described, in combination with a continuous felloe A, and its chamber, B, constructed substantially as and for the purpose set forth.

67,188.—PLOW BEAM.—William Gilman, Ottawa, Ill.

I claim the employment for plow beams of a hollow and tapering wrought-iron pipe, substantially as described in the foregoing specification.

67,189.—MACHINE FOR LINING PERCUSSION CAPS.—Derick N. Goff, Wolcottville, Conn.

I claim the punch g, to cut out the disk of foil, in combination with the pressing punch h, and mechanism for presenting the percussion caps successively, substantially as set forth.

67,190.—MACHINE FOR TRIMMING PERCUSSION CAPS.—Derick N. Goff, Wolcottville, Conn.

I claim a revolving cutter formed with a chisel edge, in combination with a die to hold a percussion cap while the edge thereof is trimmed by the action of said revolving cutter, as set forth.

67,191.—BREAD CUTTER.—W. S. Gray, Worcester, Mass.

1st, I claim the combination, substantially in the manner described, in a bread-cutting machine, of a sickle shaped cutter rotating in a vertical plane parallel with a head block moving in a path at right angles to the cutter, for the purposes specified.

2d, The combination of the cutter, the crank handle, and the brace, all arranged and operating as described.

3d, The combination, substantially as described, of the head block, the feed bar, and the working lever with the cam on the cutter shaft, for the purpose set forth.

4th, The combination as described of the feed bar, the retracting spring, and the adjusting screw, with the pawl on the head block for the purpose of regulating the thickness of the slice.

67,192.—LOCOMOTIVE HEAD LIGHT.—E. L. Hall, Utica, N.Y.

I claim the tube B, constructed and operating substantially as described, and for the uses and purposes mentioned.

67,193.—STEP LADDER.—D. B. Hedden, Newark, N. J.

I claim the strips A B, brace F, and stay G, made of bent stuff, substantially in the order and for the purpose named.

67,194.—TUBE-HOLE CUTTER.—Wm. H. Henshall, Philadelphia, Pa.

1st, I claim the improved tool, as a whole, constructed and arranged as herein shown and described.

2d, The combination of the cutter D, adjusting collar F, and the countersink tool G, constructed and arranged as shown and described.

3d, The combination of the threaded spindle A, feed wheel or nut C, spiral spring E, collar g, and the cutter D, constructed and arranged as shown and described.

67,195.—MACHINERY FOR PREPARING FLOOR OIL CLOTH.—Seth W. Herrick and Charles G. Gilbert, Jr., Salem, N. J.

We claim the described arrangement of the rollers, D and D', the cylinders, C and C', the friction pulley H, with its strap h', and treadle, h2, and the weighted swinging-frame E, the said parts being combined together in a suitable frame A B, so as to operate substantially as and for the purpose described.

67,196.—CLOTHES-LINE HOOK.—J. L. Howard, N. Y. City.

I claim a clothes-line hook, constituted of a rigid bracket extending into the form of a hook, between the jaws of which there is embraced and supported a roller of non-corrosive material turning on a vertical or nearly vertical axis, the whole being combined and applied substantially as described for the purposes explained.

67,197.—BELT COUPLING.—R. J. Jordan, Elkhart, Ind.

I claim the plates B, provided with inclined depressions or pieces, e, formed on the sides of the slots c and c', and spear-head rivets b, in combination with the belting A, substantially in the manner and for the purpose as herein set forth.

67,198.—PRINTING PRESS.—Anson Judson, Brooklyn, N. Y.

1st, I claim the combination with the segment H, of the pin G, and jaws J, by which the said segment is rotated intermittently to produce, by means of the pinion K, wheel M, and rack N, or their equivalents, the backward motion of the bed, substantially as set forth.

2d, The combination with a cylinder B, having segments E, at each end, which mesh intermittently into racks D, at each side of the table of the segment H driven intermittently by the pin G, substantially as and for the purpose hereinabove described.

67,199.—SUSPENDING CLAW FOR HORSE HAY FORKS.—C. S. Kershaw, Sherburne, N. Y.

I claim as an article of manufacture the suspending claw, the same consisting of the jaw A, provided with hook a, at one end, and the connecting hook or eye b, at the other end, and combined at right angles with the claw C c, by means of pivot D, substantially as herein described and for the purpose specified.

67,200.—KNIFE SHARPENER.—Thomas K. Knapp (assignor to John Goulding), Worcester, Mass.

I claim the peculiarly-formed frame with its four forks C, and a hole through its center to receive the sharpening bar B, substantially as shown and set forth.

2d, Cutting the teeth a, upon the sharpening bar B, substantially as and for the purposes set forth.

3d, The combination with the double-forked frame A, of the sharpening bar B, set on thumb screw D, ferule E, and handle F, constructed and combined together substantially as and for the purposes set forth.

67,201.—HORSE COLLAR.—Daniel Lincoln, Johnsonburg, N.Y.

I claim a locking or coupling device, as herein described, inserted into or connected with the lower parts of a horse collar, for the purpose set forth.

67,202.—CORN-CAKE MACHINE.—Hiram and Charles Littlefield, Tewksbury, Mass.

1st, We claim the pressing follower, when constructed as shown and described, viz., with stationary or unyielding bars B, and arranged to operate as and for the purposes specified.

2d, And in combination with the pressing follower, constructed as described, the stamping follower A, and blades k, springs C, and pressing frame G, in the manner and for the purpose set forth.

67,203.—WATER WHEEL.—W. G. McGargy, Kutztown, Pa.

I claim the slanting scroll buckets A, sliding gates B, lever C, and crank D, when constructed, arranged, and operated as herein described and for the purposes set forth.

67,204.—STEAM-ENGINE SLIDE VALVE.—Philip C. McManus, Troy, N. Y.

I claim the steam tube or post A, provided with flanges D, and shoulder X, pressing on the valve C, substantially as set forth.

Also, I claim the guide H, substantially as described, to hold in proper adjusted position on the valve C, the steam tube A, as set forth.

Also, I claim the arrangement of the steam tube A, with the india-rubber springs N N, for the purpose of giving to the flange D, of the steam tube A, a constant yielding pressure upon the valve C, substantially as herein described.

Also, I claim the arrangement of the collar I, bolts K, and nuts L, and india-rubber springs N, substantially as set forth and described.

67,205.—CHURN DASHER.—F. McTarnahan, Santa Clara, Cal.

I claim a churn dasher constructed as herein described.

67,206.—FANNING MILL.—Stuart Miller and Ira J. Chase, Barrington, Ill.

We claim the lower and the upper floors A and B, of the fan chamber, shaped so as to direct the blast of the fan upwards under the scives, constructed substantially as herein set forth and specified.

67,207.—HEDGE SHEARS.—J. O. Minor, Wapello, Iowa.

1st, I claim constructing shears with cutting edges b b', and cutting edges, a a', substantially in the manner described and for the purposes specified.

2d, The adjustable stop f, applied to one of the shear arms, substantially as and for the purpose described.

3d, The supporting strap C, applied to trimming shears substantially as described.

67,208.—WHIFFLETREE COUPLER.—Francis B. Morse, New Haven, Conn. Antedated June 7, 1867.

I claim the combination of the elastic presser with the recess d, and the screw bolt c, when the whole is constructed, combined, and fitted for use substantially as herein described.

67,209.—CAR COUPLING.—Smith O'Blenis (assignor to himself and C. H. Stark), Greensburg, Pa.

1st, I claim the hook E, constructed, arranged, and operating as described.

2d, The combination substantially as described with the bell-mouth casing of the slotted yielding coupling hook, having both a horizontal and a vertical movement in its bearing, whereby the hook acts as a bumper, and is also made self-locking.

67,210.—BAYONET ATTACHMENT.—P. A. Oliver, Elizabeth, N. J.

I claim a spring catch D D', arranged as represented relatively to the bayonet socket B b, and adapted to operate relatively to the barrel A, and projections a, or its equivalent, substantially in the manner and for the purpose herein specified.

67,211.—HARVESTER.—Henry Pease, Brockport, N. Y.

1st, I claim the hub D, in combination with the pitman u, crank 40, bevel wheel y, bevel pinion 41, rollers b b, seat supports c c", arm or arms d d, pitman passage R, and ground wheel B, substantially as described and for the purpose set forth.

2d, The hub D, in combination with the arms d d, pitman u, and pitman passage or opening R, substantially as described and for the purpose set forth.

3d, The hub D, in combination with the rollers b b, pitman u, hollow bearings r r, and pitman passage or opening R, substantially as described and for the purpose set forth.

4th, The double or grooved rollers b b, in combination with the hub D, and tread rim o, and internal gear 46, substantially as described and for the purpose set forth.

67,212.—DOOR BELL.—Chester Penfield, New Britain, Ct.

I claim the revolving prong cam h, in combination with mechanism for striking a bell, substantially in the manner as described.

67,213.—LOCK LATCH.—N. Petre, New York City, assignor to himself and Joseph H. Suggett.

1st, I claim the eccentric barrel K, in combination with the latch bolt F, and notched hub, E, substantially as described for the purpose specified.

2d, The notched eccentric K, in combination with the spring latch bolt F, and notched hub B, as described, whereby the latter is prevented from engaging with the latch F, when locked, substantially as described for the purpose specified.

67,214.—CUT-OFF STOP COCKS.—Wm. H. Pollard (assignor to Downs & Co.'s Manufacturing Company), Seneca Falls, N. Y.

I claim the valved, swiveled spout C', and clamping nut D, in combination with the valved outlet pipe C, of a double discharge pump, the whole arranged and operating in the manner and for the purpose herein set forth.

67,215.—MODE OF SEALING FRUIT JARS.—Ebenezer Purdy, Ithaca, N. Y.

1st, I claim making a tubular orifice in the cover of a fruit can, with the larger end of the tubular opening on the inside of the jar, for the purpose of closing the opening by a suitable plug or cork drawn or inserted in the same from the inside of the can, as described.

2d, I claim making a suitable plug to fit the described tube or orifice, retracting and inserting the same from and into the said orifice or opening from the inside of the can or jar, for the purpose of opening and closing the same at pleasure as described.

3d, I claim attaching the described cork or plug to a cord, E, or other suitable instrumentality, for the purpose of bringing the plug from the inside of the jar tightly into the opening, as described.

4th, I claim the combined whole, made of the parts, D, the tube or tubular opening in the cover, C, the cork or plug, F, inserted from the inside of the jar, string, wire, or instrument, E, holes, G, operating together substantially as described.

67,216.—CARBURETING APPARATUS.—Franklin Ransom, (assignor to T. F. Rand), Buffalo, N. Y.

I claim two or more air wheels, B, mounted on the same shaft, and connected by the concentric cylinder, L, in combination with the receiver, C, and tub, A, arranged substantially as and for the purpose set forth,

I also claim in combination with the wheels, B B, the brakes, h h, actuated by the float, M, and lever, v, for regulating the operation of the apparatus, substantially in the manner specified.

I also claim the regulating vessel, J, and tube, N, arranged within the carbureting vessel, E, and operating substantially as described.

I also claim the shield, G, in combination with the fibrous material, H, and vessels, J E, as and for the purpose specified.

I also claim in combination with the carbureting vessel, E, the reservoir, F, for supplying the hydro-carbon liquid to the former, operating in the manner set forth.

67,217.—MANUFACTURE OF GAS.—John T. Rich, Philadelphia, Penn. Antedated March 25, 1867.

1st, I claim the process for preparing atmospheric air for chemical union with decomposed hydro-carbons for the purpose of forming a permanent heating or illuminating gas, substantially in the manner set forth.

2d, The combination of the steam pipe, h, funnel-formed mouth, a, of the pipe, b, and condenser, K, said parts being constructed and arranged substantially as set forth.

3d, Mixing a purified product of atmospheric air with hydro-carbon gas for dilution, either before or after decomposition of the fluid or other hydro-carbon, substantially as set forth.

67,218.—SIFTER, EGG-BEATER, AND SPICE-MIXER.—C. Rosenberry and T. Worth, Chicago, Ill.

1st, We claim the revolving heads, D and D', so connected by rods that they can be separated for the insertion of various styles of beaters to adapt the implement to different uses when said heads are mounted on a revolving shaft, and placed in a case, A, substantially as described.

2d, The combination of the beaters, I, mounted on the shaft, B, having the wheel, M, attached, and the beaters, E, driven by the tube, C, and wheel, N, when arranged to be operated by the double wheel, K K', as shown and described.

67,219.—GEAR-CUTTING WHEELS.—Thomas B. Russell, Salem, Mass.

1st, I claim the combination of the spindle, M, pivoted boxes, F and L, the sliding frame, E, and the swing brace, D, for the purpose specified.

2d, The improved apparatus when the several parts are made and arranged substantially as described and used for the purpose set forth.

67,220.—FIRE-PROOF POWDER MAGAZINE.—Rufus S. Sanborn, Ripon, Wis,

I claim the application of a bath of steam to the interior of a magazine or other vessel for the reception of gunpowder or other explosive materials, in order to secure the contents from explosion when the magazine or vessel is exposed to a high degree of heat.

67,221.—COMBINED HORSE RAKE AND HAY SPREADER.—E. E. Seymour and S. J. Taylor, Rome, N. Y.

1st, We claim a revolving rake provided with a driving band, and with stops, K, or their equivalents, so that the implement may be adjusted to be used as a rake, or as a tedder, as may be desired, by sliding the rake head toward or away from the driving wheel, as and with the effect set forth.

2d, The revolving rake head, M, mounted in bearings at the ends of the sliding arms, B B, so that the same movement by which the rake head is brought in contact with the stops will loosen the band, G, and it will cease to operate the rake,

3d, In combination with the rake-head, M, and sliding bars, B B, the levers, F E and L, substantially as and for the purposes set forth.

4th, In combination with the arms, B B, and guides, I I, the adjusting screws, R R, substantially as and for the purpose set forth.

67,222.—ROLLING CUTTERS FOR PLOWS.—J. H. Sherman, Galesburg, Ill.

1st, I claim the frame, B B', separate from the standard, but attached to it by means of sockets or socket, allowing a lateral play of the frame about the standard, substantially as set forth.

2d, The form of sockets, C C', fitting the standard at its front edge, but sufficiently open at the back part to allow a lateral swing of the frame, substantially as and for the purpose set forth.

67,223.—WATCH.—O. F. Stedman, Ravenna, Ohio.

1st, I claim the band or spring, E, with its ends embracing the pillar posts on each side of the barrel closing the space between the plates, C and D, of the movement as and for the purpose set forth.

2d, The packing, d d, in combination with the band or its equivalent, for the purpose of closing the channel, substantially as specified.

67,224.—WATCH CASE.—O. F. Stedman, Ravenna, Ohio. Antedated February 22, 1867.

I claim the diaphragm, G, when arranged in connection with the case in such a manner as to form a shoulder for the support of the movement plate, K, and so constructed that it is held in position by the movement screw, a, or its equivalent, substantially in the manner and for the purpose described.

67,225.—OILER.—Frederic Stone, New York City. Antedated July 17, 1867.

I claim the bent or folded air tube, d, applied to one oiler, in the manner and for the purpose set forth.

I also claim the drip cup, c, and tube, d, in combination with the oiler, substantially as and for the purposes set forth.

67,226.—FEEDING APPARATUS FOR CARDING MACHINES.—Daniel Tainter, Worcester, Mass,

I claim the combination with a carding machine, picker or lapper, of two or more feed aprons or creepers, arranged relatively to each other as herein described, so as to deliver the material they carry to a single set or pair of feed rolls.

67,227.—CAST-STEEL CAR WHEEL.—John Blake Tarr, Chicago, Ill.

I claim a cast-steel car wheel which has been condensed by high pressure when in a molten state after it has received its general final shape, substantially as and for the purpose described.

67,228.—MILK PAN.—William Templeton, Rockville, Pa.

I claim the combination of a pan or vessel, A, and an air chamber, X, substantially as and for the purpose described.

67,229.—PROCESS OF TREATING PAPER STOCK TO MAKE PULP.—Joel Tiffany, Albany, N. Y.

I claim the introduction and use of a highly heated boiling liquor into the stock, inclosed in a close boiler immediately after the air has been exhausted therefrom, in combination with the vacuum produced within the boiler by such exhaustion of the air, substantially in the manner and for the purpose above described.

I also claim the above process in combination with the use of atmospheric or pneumatic pressure, substantially in the manner and for the purpose above described.

67,230.—COTTON PRESS.—David R. Torbet, Columbus, Ga.

I claim the so constructing and arranging of the press box and its connected co-operative parts as that it may be swung clear out from under the platen or frame to be filled, and swung back and fastened so that pressure from one or both ends may be applied, substantially in the manner and for the purpose described.

67,231.—COTTON BALE TIE.—C. Ulmer, Mobile, Ala.

I claim the within described buckle or tie provided with opening, D, slot, e, and toothed corners, c c c c, substantially as and for the purpose set forth.

67,232.—DUST PAN.—Marcus Vanderhoven, Utica, N. Y.

I claim the mode of connecting the bed or plane, C, with the sides, A, and back, B, upon their inner surface, at a line nearly or quite central, as represented in Figs. 1 and 2, the whole being arranged as and for the purpose set forth).

67,233.—ROOFING COMPOSITION.—James R. Van Horn and J. B. Roberts, Newtown, Pa.

We claim the combination with coal tar or naphtha of the mineral above described, as a composition for roofing.

67,234.—CORK PULL.—J. D. Van Zandt, Brooklyn, E.D., N.Y.

I claim the construction of the prong of a cork drawer in two parts, the one part in the handle, the other sliding upon the fixed prong, combined with the pivoted swing bar, the whole arranged and operating in the manner and for the purpose described.

67,235.—STEP LADDER.—Timotheus Vogelmann, Hamilton, O.

1st, I claim the ladder, A, constructed with the grooves, a a, in combination with the ladder, B, constructed with the ribs, g, arranged and operating in the manner and for the purpose described.

2d, The hinge clasp, C, represented in Fig. 4, in combination with the rails of ladder, A, all constructed, arranged, and operating in the manner and for the purpose described.

3d, The combination of double hooks, h, and brackets, i, constructed, arranged, and operating with hinge clasp, C, and ladder, B, in the manner and for the purpose specified.

67,236.—DIE FOR FORMING COTTON TIES.—Chas. W. Wailey, New Orleans, La.

1st, I claim the die, A A' B, and cutter, D, in combination with the separating bar, E, when constructed, arranged, and operating in the manner described, for the purpose of stamping or cutting out buckles to be used as cotton ties, from suitable plates or bars of iron, as set forth.

2d, The combination of the said die and its appendages with the matrix, G, when the latter is constructed as described, and is provided with the movable bar, J, or its equivalent, as described, for the purpose set forth.

3d, The combination of the said die and and its appendages, matrix, G, and movable bar, J, with the bent arm, F, when these parts are constructed and arranged relatively to each other substantially as described for the purpose set forth.

67,237.—WHIP SOCKET.—Theos Weaver, Harrisburg, Pa.

1st, I claim a whip socket in sections, flared or widened at a place suitable for the insertion of a locking device or line holder, substantially as herein set forth.

2d, A whip socket provided with a set of single clutches, rigidly attached or removable, to grip the rod in a dash, in combination with a brace, substantially as herein set forth.

3d, The mode of preventing the revolution of a socket at its bearings on a rod, by means of the indented arcs, 1, 2, 3, 4, in Figs. 1 and 5, for the purpose specified.

4th, The locking fastening as shown in Figs. 3 and 8, and otherwise described.

5th, The combination of the bands, B' K' B' K', with a socket for the purpose specified.

6th, The slides, o' o', the holes, 9, 9, 9, 9, Fig. 3, in combination with the brace, Fig. 5, and the screw, E, for the purpose herein specified.

7th, The combination of a tumbler or tumblers with a locking thimble provided with a flange at the top, the teeth, 1, 2, 3, 4, key hole, g, key guard, B the toothed lock shield, 1, 2, 3, 4, the ledges, R V A, handle, H, stop, S', when made to operate by a key as herein set forth.

8th, The combination of the subjects of the seventh claim with a circle of notches as shown in Fig. 4, or with two circles as shown at 12, Fig. 3, for the purpose herein set forth.

9th, The combination of ring, A, with a hook, H', for the purpose specified.

10th, Clothing or covering the parts of a lock that come in contact with a whip stock in a socket with a suitable material, substantially in the manner as and for the purpose herein shown and described.

11th, I claim inserting a key in a vertical or upright position in a whip lock, as shown in Fig. 1.

67,238.—BED BOTTOM.—P. W. Webster and Wm. H. Prescott, Concord, N. H.

We claim the side pieces, a, end pieces, b and d, slats, c, and wires, f, when combined to form a reversible spring bed, substantially as described.

67,239.—FIRE ESCAPE.—Carl Weidling, New York City, assignor to himself, Alexander Lieder, and Charles Kinkel.

1st, I claim the upper frame, F G H, with its windlass, I, and chains or ropes, K K, all combined with the ladder as and for the purpose set forth.

2d, In combination with the upper frame constructed and arranged as described, I claim the lower frame, A B C D, with its turn table, as and for the purpose set forth.

67,240.—MACHINE FOR POLISHING WOOD.—Edward Weisenborn, Hudson City, N. J.

1st, I claim the combination of two endless aprons, H E, and the grooved guide blocks, e', with the supporting table between the aprons, for receiving, holding, and carrying the pencils under the polishing blocks, and discharging them therefrom arranged, constructed, and operating in the manner and for purposes described.

2d, The combination of the aprons, table, and guide blocks aforesaid, with the polishing blocks, J J, constructed and arranged and operating in the manner and for the purposes described.

3d, The combination of the bent vertical pressure springs, M, with the polishing blocks, J, the springs being provided with slots and buttons for adjustment as described, constructed, arranged, and operating in the manner and for the purpose described.

4th, The combination of the polishing blocks, J, with the side pieces or supports, j, to guide the polishing blocks and support them at the desired point, so that the pencils may pass under them with facility as they are carried along by the aprons, and at the same time receive the required pressure for polishing.

67,241.—CONSTRUCTION OF VESSELS.—N. F. Weston, Boston, Mass.

I claim the application to the outer surface of the hull of a navigable vessel, of a closed boxes or tanks, so constructed and arranged as to answer the purpose of either buoys or ballast, as well as being productive of other advantages, substantially as hereinbefore shown and described.

I also claim in combination with the outer tanks, A' A', the inner compartments, a' a', essentially in manner and for the purpose as specified.

67,242.—MAGAZINE FIRE-ARM.—James A. Whitney, Maryland, N. Y. Antedated July 19, 1867.

1st, I claim the breech block, E, constructed with a carrying chamber, g, arranged below and back of the solid recoil face, f, thereof, in combination with the barrel and a suitable cartridge magazine, substantially as and for the purpose specified.

2d, So combining the arm, e, of the operating lever with the breech block, E, that the forward movement of the said arm shall not only elevate the breech block to bring the recoil face thereof away from, and the carrying chamber in line with the bore of the barrel, but shall also operate to force the cartridge from such chamber into the said bore, substantially as herein set forth.

3d, The combination of the downwardly extending spur, D, of the breech block, with the arm, e, of the operating lever, substantially as herein set forth for the purpose specified.

4th, A slot formed in the breech block and extending through or into the carrying chamber, g, thereof, of such shape and so arranged in relation with the arm, e, of the operating lever that the said arm by its forward movement shall simultaneously hold the breech block in a stationary position and force the cartridge from the carrying chamber into the barrel, substantially as herein set forth.

67,243.—COTTON PRESS.—Young F. Wright, Green Hill, Ga.

I claim in combination with the arch, nut, and sweeps, operating in connection with the platen screw, as herein represented, the hinging or pivoting of the arch, so that it and its several appliances may be run or swung around upon a curved horizontal, or nearly so, way, to clear the top of the press box, to allow it to be readily filled, substantially as described.

67,244.—LAMP FOR DESTROYING INSECTS.—John Zimmerman, Royalton Center, N. Y.

I claim the lamp constructed as described, with a socket to secure it on the top of a pole, double walls with air orifices, and whose wick tubes are provided with perforated flaring nozzles, as described and represented.

67,245.—SLATE PENCIL SHARPENER AND HOLDER.—W. H. Alcorn, New York City.

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1st, I claim providing a slate frame with a combined slate pencil holder and sharpener, for the purpose set forth.

2d, The semitubular plate, B, when provided with one or more lugs, b, or their equivalents, and with a spring, C, and with a corrugated surface, c, all as set forth.

67,246.—OYSTER OPENER.—J. E. Alger, New York City.

1st, I claim an apparatus for opening oysters, the arrangement of a fixed jaw, G, substantially as and for the purpose herein set forth.

2d, The combination of a reciprocating knife or opener, H, with a support having grooves or recesses, c, for adjustment and retention of the oyster to and against the action of the knife, substantially as herein set forth.

67,247.—BRUSH RACK.—John Ames, Lansingburgh, N. Y., and N. H. Horton, New York City.

We claim a rack for exhibiting paint, varnish, and other similar brushes, as specimens, consisting of a shallow box, A, provided with one or more cleats, B or B', arranged substantially as herein shown and described.

67,248.—WASHING MACHINE.—Chancy L. Andrews, Connecaut, O.

I claim the combination and arrangement of the box, A, frame, B, with parallel grooves, B', in the side pieces, pins, C, corrugated roller, D, handle, E, and bars, F, substantially as set forth.

67,249.—MACHINE FOR PACKING FLOUR.—H. A. Barnard, Moline, Ill.

I claim the two pulleys. G and E, and the compound or double brake, K M, in combination with the shaft, F, friction wheel, J, weight, L, and the barrel support, C, substantially as herein shown and described and for the purpose set forth.

67,250.—PAPER CORSET.—Joseph H. Beal, Edward J. Sawyer, and Granville S. Webster, Boston, Mass.

We claim as an improved article of manufacture, a corset made from paper or paper pulp or their treatment by a combination with other materials, substantially as explained.

67,251.—STOVEPIPE DRUM.—J. F. Beckwith, Albion, N. Y.

I claim the cylinder, A, provided with vertical pipe, B, beveled flanges, C C, air tubes, D D D, damper plate, E, and cap, I, all being constructed, arranged, and used in the manner and for the purposes set forth.

67,252.—CORN AND COTTON SCRAPER.—C. Billups, Norfolk, Va.

1st, I claim the standard, C.

2d, The slots, c c', when used for the purpose specified.

3d, The mold board, E, having two horizontal slots, e e', for the purpose specified.

4th, The detachable landside and the method of attaching it, as described.

5th, The center board or pivot cutter, C, working in connection with the landside, substantially as and for the purposes described.

6th, The slot, d, through which the center board or pivot cutter passes, and the mode of securing and fastening the same.

7th, Claims 5th and 6th as applied to all plows.

67,253.—MACHINE FOR LINING PERCUSSION CAPS.—Amos S. Blake, Waterbury, Ct.

1st, I claim a slide for carrying the caps to the die and punch for being acted upon by the latter, when such slide is arranged to have an intermittent forward and backward motion, as the punch moves up and down through the die, substantially as and for the purpose described.

2d, In combination with the above a plate or plates suitably constructed to receive the caps, and so arranged and operated with regard to the slide for carrying them to the punch and die as to feed and deliver the caps to the slide, substantially as described.

67,254.—MEAT CUTTING MACHINE.—William Bliesner, St. Louis, Mo.

1st, I claim the combination of the feeding apparatus, A, with the meat-cutting machine, all arranged as specified.

2d, The continual motion of the knives in three different directions, as and for the purpose described,

3d, The simultaneous motion of the knives, b2 b3, by means of the lever, b*, and the eccentric wheel, c1, as and for the purpose described.

4th, the arrangement of the shaft, c13, with the cog wheel, c11, and the rack, c12, which permits the drawing back of the piston without affecting the remainder of the machinery.

67,255.—STEAM GENERATOR.—Charles T. Boardman, Pawtucket, R. I.

I claim the arrangement. substantially as herein shown and described, of the single and double sections, G G', constructed of horizontal and vertical tubes with steam spaces or chambers, and set for passage of the draft in reverse and return directions relatively to them, as herein set forth.

67,256.—GRAIN DRYER.—Henry Boden, Olney, Ill.

I claim the arrangement and construction of the steam chambers, C C C, with their receiving and discharge steam pipes, E E, on the outside, and draft flues, G, on each side of the coolers, D D D, below, when arranged, constructed, combined, and operating as herein described and for the purposes set forth.

67,257.—SUSPENSION TURN TABLE.—John C. Bonnell, Fort Madison, Iowa.

I claim the arrangement of the wheel, H, shaft, J, bolt, G, and dog, I, in combination with the swinging frame, in the manner substantially as and for the purposes specified.

67,258.—SASH SUPPORT AND FASTENER.—J. C. Bonnell, Fort Madison, Iowa.

I claim the combined dog and cam, D, having a beak upon its outer end and a shoulder on its top whereby the beak may catch into the opening in the sash and check the window or support the same by its cam in the desired position, when arranged within a metal box, c, formed of one piece of metal and held in position, as well as being pivoted by the screws that connect the box to the frame as specified.

67,259.—WATCH.—Felix Benoni Bouscatié, Paris, France.

I claim 1st, The combination with the bridge of the escapement of the scape wheel and its pinion under the arrangement and for operation as herein set forth.

2d, The construction and arrangement of the disk for supporting the balance and escapement substantially as herein described.

3d, The combination with the supporting disk of the bridge and balance and escapement pivoted on the same as shown and described.

4th, The combination and arrangement of the regulator with the ballance wheel and its hair spring substantially as and for the purposes herein set forth.

5th, The arrangement of the bridge for carrying the escapement substantially as and for the purposes described.

67,260.—FANNING MILL.—John J. Bradner, Pine Creek, N. Y.

I claim the toothed rack, F, and the stud, F, or their respective equivalents attached to the conductor and screen of a fanning mill substantially as and for the purpose described.

67,261.—STRAW CUTTER.—J. D. Burdick, New Haven, Conn.

I claim 1st, The shifting spur gear, G, provided with a concentric pinion, H, in connection with the pinions, d d, on the feed roll shafts and the intermediate pinions, K L f, all to operate so as to vary the speed of the feed rollers according to the length of cut required substantially as shown and described.

2d, The intermediate pinions, K L f, placed on fixed studs or axes in combination with the pinions, d d, on the feed roller shafts arranged substantially as and for the purpose specified.

3d, Securing the fixed cutter or leger blade, M, to its bed piece by means of bolts, h h, the heads of which are fitted in oblong slots, j j, in the cutter or plate substantially as and for the purpose set forth.

4th, The adjusting keys, O O, passing vertically or nearly so through the fixed cutter or leger blade and arranged in relation with the frame or head, D, of the feed rollers substantially as and for the purpose specified.

5th, Constructing the fixed cutter or leger blade, M, of curved form in its transverse section, and having the inner edge of the same slotted as shown for the purpose set forth.

6th, Securing the arms, Q Q, of the cutter, P, to their shaft, J, in the manner shown or in an equivalent way to admit of the slipping of the arms on the shaft or the turning of the latter within the former in case the cutter meets with any material obstruction in the prosecution of its work.

67,262.—MACHINE FOR LAYING RUBBER SHEETS TO BE CUT into Threads.—D. H. Buzzee, East Hampton, Mass.

I claim 1st, The combination in a machine for laying rubber sheets of the cyinders, B and C, and tension device or brake arranged to act simultaneously upon both ends of the feeding cylinder the whole being constructed for operation together substantially as specified.

2d, The combination with the feeding cylinder, C, of the split clamping rod, D, arranged to occupy a recess in said cylinder in direction of its length and gearing with the same essentially as herein set forth.

67,263.—KNITTING MACHINE.—A. C. Carey, (assignor to himself and H. K. Moore), Malden, Mass.

I claim 1st, The combination of revolving and vibrating jacquard pattern cylinders with sliding needles on a straight frame for the purpose of knitting irregular tubular work substantially as described.

2d, Also combining and arranging in connection with two rows of needles two jacquard cylinders that are at times both thrown forward together at other times thrown forward alternately first one and then the other and at times cease to revolve as the style, shape or pattern of the article that is being knit may require substantially as described.

3d, Also, In combination with vibrating jacquard cylinders and with needles in straight rows the wires interposed between the jacquard and the needles by which the needles are operated from the jacquard substantially as and for the purpose described.

4th, Also the use of nibs or projections on the wires that are interposed between the jacquard and the needles and remote from the ends of said wires so that the needles in the line of such nibbed wires may be moved forward far enough by the jacquard to catch and hold the yarn but not to knit and thus prevent the making of holes in the knit work substantially as described.

5th, Also the combined use of a pattern wheel having a toe and heel segment thereon and the jacquards for operating the pawls by which the jacquards are turned on their axes substantially in the manner and for the purposes described.

6th, Also a yarn tension composed of the arm, 8, post, 7, turning arm, 9, guides, 12, and suspended weight or ring, 13, arranged to operate in the manner and for the purpose substantially as herein described.

67,264.—MACHINE KNITTED STOCKING.—A. C. Carey (assignor to himself and H. K. Moore), Malden, Mass.

I claim as a new article of manufacture, a machine made knitted stocking, the toe of which is commenced in the center of the two rows of straight needles and the heel of which is knit upon one of the two straight rows of needles of the machine while the portions are the product of both rows, by which means I produce a heel of other closely knit, without holes or openings, and of better shape and form than heretofore knit by machinery, and bearing a greater similarity, with regard to the toe portion, to hand-knit stockings, substantially as herein described.

67,265.—DEFLECTOR FOR HOT AIR REGISTERS.—S. Hamilton Caughey, Baltimore, Md.

I claim the box, A, with its perforated top doors, E d and G, and water tank, arranged substantially as described and represented.

67,266.—CHURN.—C. J. Chalfant, Unionville, Pa.

I claim the right angular buckets, E, secured to the inner circumference of the revolving cylinder churn, c, in the direction of its length, substantially as described for the purpose specified.

67,267.—BUTTONS.—Victor Chalet, Hoboken, N. J.

I claim the combination of a button or stud, A, with a ground or slotted shank, B, and sliding spring plate, D, all made and operating substantially as and for the purpose herein shown and described.

67,268.—HEMP BRAKE.—Erastus Christianson, St. Joseph, Mo.

I claim a hemp brake having frame, A, platform, B, cog wheels, C, circle H, set screws, L L, cog wheels, M, and lever, N, constructed, combined and operating substantially as specified.

67,269.—SLIDE FOR RULES, SCALES, AND TABLES.—F. J. Coffin, Newburyport, Mass.

I claim the slide, A, or its equivalent, in combination with a rule, scale or tablet, the said slide containing one set of dimensions, or factors, to find out the contents or product, in connection with another set of dimensions, or factors, marked on the rule, scale or tablet, substantially as shown for the purposes herein specified.

67,270.—CLOTHES DRYER.—Israel A. Coons, Middleton, O.

1st, I claim the adjustable folding frame, A' B', connected with the stand on uprights, A A, by means of the links, e e, or slots, M, when constructed, arranged and operating in the manner and for the purpose described.

2d, The fastenings represented in fig. 4, in combination with uprights, A A, arms, B B, or their equivalents. folding frame, A' B', when the several parts, arranged, combined and operated together, substantially as and for the purpose described.

67,271. — WASHING MACHINE. —LeRoy Corille, and William Keeler, Oxford, N. Y.

We claim the reciprocating frame, E, and roller, D, in combination with the perforated or other washboard, C, springs, J, and rails, f, all made and operating substantially as herein shown and described.

67,272.—MODE OF APPLYING WINDOW SHADES TO WINDOWS. H. J. Cox and Wallace Hill, Long Eddy, N. Y.

We claim the spring, D, pulleys, d d, and cords, t f, connected with the shade roller, E, in combination with the cord, G, and ring, j, and tack or hook, k, or their equivalents for holding or securing the bottom of the shade when necessary all arranged substantially as and for the purpose set forth.

67,273.—HORSE POWER.—J. C. Cox, Greenville, N. C.

1st, I claim the cross pieces, E, beveled at their ends and provided at both ends with horns, G and H, interlocking each within the cross pieces in the manner described as and for the purpose specified.

2d, The combination of the pulleys, P and R, gear wheel, T, and pulley, V, with each other and with the frame, O, and rope, F, substantially as described and for the purposes set forth.

3d, The combination of the weighted lever, E' ratchet wheel, D', shaft, C', pulley, B', and cord, A' with each other, with the frame, O, and with the sliding frame, S, substantially as described and for the purpose set forth.

4th, The combination of the pulley, G' and weighted frame, H, with the frame, O, the pulley, R, and rope, F, substantially as described and for the purpose set forth.

67,274.—SCALE BEAM.—A. B. Davis, Philadelphia, Pa.

I claim the combination with each bar or weight of a stop rendered adjustable in the manner described or any equivalent to the same.

67,275.—SAW MILL.—J. C. Delavigne, New Orleans, La.

1st, I claim the pivoted walking-beam frame, F, having at one end the saw, H, its lower cross bar, b, connected to one end of pitman, E, whose outer end is pivoted concentrically to disk, D, on shaft, a, when all are constructed, arranged and operating as herein set forth for the purpose specified.

2d, The spring boards, K K, pivoted by link bars, e e, to each end of the walking beam frame, F, as herein set forth for the purpose specified.

67,276.—LIGHTING CIGARS.—W. B. Doudes, Canton, Ohio.

I claim as a new article of manufacture, a cigar, bearing the composition substantially as described and provided with the match in the manner and for the purposes specified.

67,277.—VAPOR BURNER FOR HEATING.—C. W. Duncan (assignor to himself and H. S. Saroni), Baltimore, Md. Antedated July 26, 1867.

I claim, 1st, An apparatus for generating heat in vapor stoves as above described, regulating the supply of fluid to the retort or heating chamber, in the manner and by the means hereinbefore specified that is to say, by locating the valve which regulates the flow of the oil or other fluid at or near the point where the fluid enters the said retort, substantially as and for the purposes herein set forth.

2d, In combination with the retort or heating chamber of a vapor stove, and valve seat located at or near the point of junction of said retort with the pipe which connects it with the fluid reservoir as specified, I claim the valve constructed and arranged so as to operate on the axis of the said pipe, substantially as and for the purposes herein shown and described.

67,278.—PAINT CAN.—Horace Everett, Philadelphia, Pa.

I claim a metal ring, B, and its flange, b, combined with the body and cover of a paint can, substantially as set forth for the purpose specified.

67,279.—FRUIT GATHERER. — Leonard Fleckenstine (assignor to himself and Peter F. Binkley), Manor Township, Pa.

I claim, 1st, The arrangement of the hinged finger supports, A, with their pin or pivot, a, in combination with the hinged jaws, E, for operating them in the manner and for the purpose described.

2d, In combination with the jaws, E, I claim the ratchet wheel, c, click, D, spring, I, between the supporting lugs, H, arranged in the manner and for the purpose set forth.

3d, I claim the united double levers, K, for operating the jaws, E, by means of cords, k, in the manner specified.

4th, I claim the arrangement of the cheek pieces, L, hinged above to the jaws, E, and attached to the pole, in the manner and for the purpose set forth.

5th, I also claim the leather cap and sack, revolving on its pivots, a, and provided with fixed and rigid fingers, F, on their respective supports, A B, arranged and operated in the manner specified.

67,280.—RAILWAY CHAIRS.—William Foster, Logansport, Ind.

I claim, 1st, The wedge, F, and gib, E, in combination with the chair, D, supporting bar, C, and rails, A, substantially as herein set forth for the purpose specified,

2d, The plates, C, and bolts, a, in combination with the supporting bar, C, chair, D, wedge, E, gib, E, and rails, A, substantially as herein set forth for the purpose specified.

67,281.—FILTER.—Alcander Fox, Poughkeepsie, N. Y.

I claim the combination of a series of labyrinthine filtering compartments, substantially as herein specified and described.

67,282.—SHIPS' DAVIT.—L. F. Frazee, South Amboy, N. J.

I claim, 1st, A four sided frame, M, hinged or pivoted at its lower edge to the vessel, substantially as and for the purpose set forth.

2d, The combination with the frame, M, of the sliding supports, E and E, constructed, attached, and operated substantially as specified.

67,283.—BASE BURNING STOVE.—C. H. Frost, Peekskill, N. Y.

I claim so arranging the cylinder, a, and the direct and indirect draft openings and passages that the said cylinder becomes an ascending channel for the escape of the products of combustion when the draft is direct and a descending channel for the supply of air to the fire when the draft is indirect, substantially as set forth.

67,284.—DRILLING APPARATUS.—A. J. Fullam, Springfield, Vt.

I claim the arrangement of the drill stand, A, engine, E, securely attached thereto, pitman, E', fly wheel, F, pinion, a, drill, B, and pipe, J, substantially as described and for the purpose specified.

67,285.—ROW LOCK.—William Fuzzard, Chelsea, Mass.

I claim the application of row blocks to a row boat in such a manner that the former will, during the operation of rowing, be moved automatically from the motion of the oars for the purpose of increasing the length of the sweep of the same, substantially as set forth.

67,286.—CLAMP FOR PAINT BRUSHES.—G. R. Gardiner (assignor to himself and B. W. Bentley), Westerly, R. I.

I claim the combination of the band, C, adjusted by means of the slide and pins with the spring fastener, F, for vertical adjustment substantially as described for the purpose specified.

67,287.—CORN HARVESTER.—W. N. Gates, Manchester Center assignor to O. J. Whitney, Hopewell, N. Y.

I claim the arrangement of the gavel discharger, P, provided with teeth, o, and resting upon the concentric frame, e, and the reel, O, provided with the points, h, gearing directly with the spokes of the supporting wheel when the said parts are combined in a corn harvester in the manner and for the purposes specified.

67,288.—LATHES FOR TURNING ECCENTRICS.—J. B. Gayle, Portsmouth, Va.

I claim the combination of the adjustable eccentric support, F carriage, E, ways, H, and sliding tool stock, I, arranged as described for the purpose specified.

67,289.—COTTON CULTIVATOR.—Charles Gibbon, Hicksford Va.

1st, I claim the combination of the front and rear plows, H H I I, with the hinged main frame, A, and lever, K, substantially as and for the purpose specified.

2d, I also claim the rotary cutters, G G, in combination with the scraper plows, H H, and the rear plows, I I, all arranged substantially in the manner as and for the purpose set forth.

3d, I further claim the pivoted bar, M, on the frame, A, in combination with the rotary cutter shaft, F, and the lever, K, all arranged substantially as and for the purpose specified.

67,290.—DOOR SPRING.—William Gilfillan, Syracuse, N. Y., assignor to himself and M. L. Van Horn, New York City.

I claim the hollow drum or casing, H, with its eccentric arm, P, and coiled spring, K, when connected with the door frame through a cord, R, or its equivalent and combined and connected together, substantially as and for the purpose described.

67,291.—PISTON FOR DOUBLE ACTING PUMPS.—C. B. Gill, Rochester, N. Y.

I claim the piston, A, having the passage, g, and the webs, b b, arranged as described and operating in the manner herein set forth.

67,292.—BOTTLE STOPPER.—John H. Gould, Newburyport, Mass.

I claim a stopper for bottles consisting of a rubber or other suitable ball held and attached to the bottle neck by a coiled spring, substantially as and for the purpose described.

67,293.—MANGLE.—Henry Gransden, Dubuque, Iowa.

I claim the rollers, D E F, the hook. G, the spring, H, the aprons, C, the fly wheel, B, and the braces, J, arranged substantially as herein shown and described in combination with the frame, A, for the purposes set forth.

67,294.—WASHING MACHINE.—Wellington Green, Kinzua, Pa.

1st, I claim the box, C, constructed with a close-fitting cover, E1 E2, with slats, D, upon its bottom, with scolloped pieces, F, upon one or both ends and pivoted to stationary supports, B, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the balance weight bar, I, with the oscillating box, C, substantially as herein shown and described and for the purpose set forth.

67,295.—CULTIVATOR.—A. M. Griswold, Momence, Ill.

1st, I claim the adjustable rods, o o, and the adjustable brace rods, j j, for the purposes specified.

2d, The joints, i i, when combined with the rods, o o and j j, and plow-bearing beams, E E, substantially as and for the purposes set forth.

3d, The cams, m m, when combined with the braces, n n, the rods, s s, and bar, r, and operating in the manner and for the purposes described.

67,296.—FRUIT PICKER.—E. W. Gurner, Haverstraw, N. Y.

I claim the basket, A, provided with the projecting splints, c c, at one side and the projecting elastic splints, b b, at the opposite side, the splints, each pair being connected at their ends by the strips, d, and having the cores, C D, applied, and all arranged substantially as and for the purpose set forth.

I further claim the canvas or other material, d*, attached to the splints, b b c c, in connection with the projecting splints, c' c', substantially as and for the purpose specified.

67,297.—FLOOR CLAMP.—J. F. Hammond, Providence, R. I.

I claim, in combination with the bed piece, A, the lever, C, the pawl, D, the steel, E, and sliding piece, B, provided with the blocks, F and G, either with or without the truck, i, substantially as described and for the purposes set forth.

67,298.—RUBBER FABRIC.—John Haskins, Roxbury, Mass.

I claim the within-described article of perforated rubber as an article of manufacture, the same being used as and for the purpose set forth.

67,299.—TOBACCO PIPE.—J. S. Hawley, Virginia City, Nevada.

I claim the lining, C, of the tobacco pipe, when cut from a corn cob and inserted in the bowl, A, as herein set forth for the purpose specified.

67,300.—HEATING TOP PLATES OF WAX-THREAD SEWING MACHINES.—William F. Hayden, Brookfield, Mass.

I claim, 1st, The combination with the top plate of a wax-thread sewing machine of a chimney, G, whereby the lamp for heating the wax can be placed under or below the top plate of the machine, substantially as and for the purposes set forth.

2d, The combination with the top plate, B, of the chamber, E, substantially as set forth.

3d, The combination with the top part, B, of the chambers, E and H, chimney, G, and pipes, I and K, substantially as and for the purposes set forth.

4th, The combination with the front part of the plate, B, of the gage, O, and thread knife support, p, substantially as set forth.

5th, Supporting the tension wheel on the stand, L, the said wheel being arranged with the pipes, I K, as shown and described.

67,301.—CORN HUSKER.—H. N. Hill, Pontiac, Mich.

1st, I claim the knives, F and G, in combination with each other and the spring treadle, J, substantially as described for the purposes set forth.

2d, I claim the slide, C, and the spring treadle, J, arranged and operating substantially as described in combination with the knives, F and G, as and for the purposes herein set forth.

67,302.—STEAM ENGINE SLIDE VALVE.—G. H. Hoagland, Port Jervis, N. Y.

I claim the combination with the valve box, D, arranged within the steam chest, of the valves, N1 N2, controlling openings in communication with the steam ports, essentially as and for the purpose herein set forth.

67,303.—CORK RECEPTACLE FOR BOTTLES.—Alexander Honrath, New York City.

I claim the forming or manufacturing of bottles and other receptacles of glass, earthenware, or other material designed for holding liquids and provided with cork stoppers with a cavity, b, in order to hold a spare cork, substantially as shown and described.

67,304.—BEDSTEAD.—Joseph Horner, New Brunswick, N. J.

I claim attaching the front and rear ends of the sacking bottom, E, to cylinders, B B', which are fitted in bearings, a. attached to the side rails, b, of the bedstead at the head and foot portions thereof in combination with the grooved wheel, f, and forked plate, C, ratchets, c., and pawls, d, all arranged and applied substantially as shown and described.

Also the bent rods or hooks, F, attached to the side rails, b, of the bedstead and passing through oblong slots, h, in the sacking bottom, substantially as and for the purpose specified.

I further claim the combination of the sacking bottom, cylinders, pawls, and ratchets, grooved wheel and forked plate and the bent rods or hooks, all arranged and applied to a bedstead, substantially as and for the purpose set forth.

67,305.—HORSE RAKE.—Charles Howard, Bearsville, N. Y.

I claim the combination of the lever, c, the cross-foot lever, K, and the spring tops, g, with the sliding bars, b b, of the rake head, D, and the thills, a a, of a horse rake, arranged and operating substantially as herein described.

67,306.—WHEEL-SPOKING MACHINE.—Alexander Humphries, and John Keethler, Mount Oreb, Ohio.

We claim a wheel-spoking machine consisting of the following members, to wit: the axial shaft, G, adjustable pillow blocks, I and J, swinging table, L, and sliding rest, o, constructed and operating substantially as and for the purpose set forth.

67,307.—FASTENING FOR LASTS.—William S. Huntington (assignor to Joseph Silliman), New York City.

I claim the button fastening for lasts constructed as described consisting of the spindle, B, revolving freely in hollow screw plug, D, which is screwed into the last, the lower end of said spindle projecting beyond the said plug, as herein set forth.

67,308.—FENCE—F. W. Huxford, Boonsborough, Iowa.

I claim the combination of an inclined or angular top, D F, with the vertical part of the fence, substantially as herein shown and described and for the purpose set forth.

67,309.—DEVICE FOR SNUFFING LAMPS.—Julius Ives, Brooklyn, N. Y.

1st, I claim a snuff tray which is adapted for being applied to the burner of a lamp for the purpose of receiving the snuff during the act of trimming the lamp wick, substantially as described.

2d, The combination of a snuff tray and scraper, substantially as described.

67,310.—CLOTHES POST.—C. P. Jadwin, Carbondale, Pa.

I claim the box base with drum crank and ratchet attached and hollow past with pulley and rope, as herein described and for the purposes set forth.

67,311.—CAR COUPLING.—W. R. Jamison, Taylorstown, Pa.

I claim the bumpers, A and B, coupling link, C, and coupling pin, D, constructed substantially as herein shown and described in combination with each other as and for the purpose set forth.

67,312.—MODE OF MANUFACTURING VENEERS.—Edward Jewett, Bridge, N. H.

I claim the mode of manufacturing veneers herein set forth by compressing the veneer continuously from the point where it is severed from the bolt to a distance in the rear of the edge of the cutter, substantially as set forth.

67,313.—SHAVE FOR BOOTS AND SHOES.—Albert E. Johnson, Oxford, Mass.

1st, I claim a tool or implement for the shaving of the edges of boot and shoe soles having one of its handles so curved in the direction of its length as to allow the shave to be passed about the curve of the upper at the shank, substantially as described and for the purpose specified.

2d, The gnard lip, J, to the knife, in combination with the adjustable guard, K, substantially as described for the purpose specified.

67,314.—SHOE STRETCHING DEVICE.—Wiley Jones, Norfolk, Va.

1st, I claim a detachable swivel connection for securing the cap or shell to the screw rod, substantially as set forth.

2d, The key or lateral projection, c, one or more, on the end of the tenon, b, of the screw rod, A, in combination with the circular recess or counter sink, d, in the outer side of the shell or cap. D, concentric with the pole, a, and the slot, e, one or more, corresponding in number to the keys or projections, c, in the side of hole, a, substantially as and for the purpose set forth.

67,315.—MANUAL POWER MACHINES.—T. L. Kenworthy and A. Silvers, Collinsville, Ohio.

I claim the arrangement and combination of the treadles, D and D', extending in front of the main frame, A B, and operating conjointly with the winch, o, when constructed and applied in the manner and for the purpose described.

67,316.—MACHINE FOR MAKING SLATE FRAMES.—William Kester, Cherryville, Pa

1st, I claim the construction of the frame-holding device, N, consisting of the sidewise adjustable bed, b', sliding table, c', notched horizontal disk, d', spring catch, f', oblong plate, e', fitting over pins on the disk, d', hinged arms, g', and horizontal locking bars, h', substantially as described for the purpose specified.

2d, The construction of the slate holder, P, consisting of the lid, i, in which the plate, k', slides, rectangular rest, l', against which one corner of the frame fits, a rectangular rest, m', having hinged lever, n', secured thereto, substantially as described for the purpose specified.

3d, The trough, c, arranged in relation with the cutters, D D, saw, e, concave cutters, E, cutters, F, spring roller, m, and rollers, g g, when constructed and operating substantially as described for the purpose specified.

4th, The construction of the revolving drills, K, crank shafts, L, having bearings in the uprights, M, and fitting in the vertical bar, t, connected to the eccentrics upon the shaft, u, all operating as described and arranged in relation with the frame holding device, N, substantially as described for the purpose specified.

67,317.—MATCH SAFE.—P. Killin and H. C. Yates. Decatur, Ill.

We claim the match safe constructed of described consisting of the box, A, divided into two parts, B C, by the partition, b, necks, c, curved wire spring, d, loop, e, grooved strip, g, pivoted feeder, i, sliding wires, h h', serrated spring jaw, m, plate, s, and cover, a, all arranged as described for the purpose specified.

67,318.—WATER ELEVATOR.—Philip H. Kimball, Prophetstown, Ill.

1st, I claim the combination of the guides, W, levers, V, and bar, S, all arranged to operate substantially as set forth.

2d, The bar, S, in combination with spring, R, friction roller, Q, trip lever, P, arranged to ship the drum, D, substantially as set forth.

3d, The drums, B, in combination with drum, D, and gearing, b a, H H' M, substantially as described.

4th, The combination of drum, B, wheel, M, gearing, H H', lever, F, toggle J, all arranged and operating substantially as described.

67,319.—AUTOMATIC MOLASSES GATE.—Philip H. Kimball, Prophetstown. Ill.

I claim the combination of a weighing or scale beam, M, carrying a movable weight, C', with a suspended platform, F', tripping devices, U L H, and with an arm or lever, W, secured to and operating the faucet or cork, S, of a barrel or other vessel, all substantially in the manner and for the purpose herein set forth.

I claim also the combination of an alarm bell, A*, with an arm, W, attached to a cock or faucet, S, when said arm is made to close said faucet automatically, substantially in the manner and for the purpose herein described.

67,320.—MODE OF TREATING RATTAN.—Louis Klein, Dansville, N. Y.

I claim the compressing of rattan or calamus as and for the purpose specified.

67,321.—PORTABLE OVEN.—Mary H. Leland, Millbury, Mass.

1st, I claim a portable oven, B, in which are combined a fire space, C, oven

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or chamber D, and a valve to drop into the top of the stove to turn the draft through the space, C, substantially as set forth.

2d, The combination with the bottom of the oven of the adjustable dampers d d', substantially as and for the purposes set forth.

3d, The combination of rib, a, tube, b, with the damper rods, c c', and dampers, d d', substantially as and for the purposes set forth.

67,322.—METALLIC LOOP.—Chas. H. Littlefield, Turner Me.

I claim the metallic plate of the described form when the part, H, is bent as described, to receive and retain the buckle and when the wings, A or B, are turned over so as to lap the harness strap, as and for the purposes described.

67,323.—MINING AND TUNNELING MACHINE.—Richard C. M. Lovell, Covington, Ky.

1st, I claim the combination of the tra erse track, the traverse platform and the adjustable carriage on which the engine is mounted, substantially as described.

2d, A mining or stone cutting machine adjustable longitudinally and laterally by means substantially as described and having two cylinders whose piston rods are connected to a working beam.

3d, I claim in cambination with the carriage, E', upon which the engine is mounted, the shaft, e, the splined wheel, E, cogged rail, A', or B', and rotating devices, d" a a' d6, or their equivalents deriving their intermittent motion from the reciprocating motion of the working beam or its motors—the pistons.

4th, I claim the combination of the traverse platform, D, the carriage, E', the threaded shaft, g, e, and clutch nut g, operating substantially as described.

5th, I claim the combination of the carriage, E', with its rack bar, d', on the traverse platform the pawl, d'", and latch, d"", constructed and operating substantially as described.

67,324.—VALVE FOR STEAM ENGINES.—Richard C. M. Lowell, Covington, Ky.

I claim the arrangement of the pistons, i i, ports, m m, and double acting valve moving piston, T, substantially as described.

67,325.—BREAD CUTTER.—John Madden, Cleveland, Ohio.

I claim chamfering the bottom of the table immediately under the horizontal knife, C, in combination with said knife for the purpose and in the manner substantially as set forth.

2d, The horizontal knife, C, and table, A', in combination with the sliding frame constructed and arranged in relation to each other as and for the purpose set forth.

67,326.—SPRING SEAT.—Joseph I. Mabbett, Titusville, Pa.

I claim the frame, A A A, in combination with the rod, C C C C, and the elastic bands, 1 2 3 4 5 6 7 8, when the same are constructed as described in the aforesaid combination for the purposes set forth

67,327.—COTTON GIN.—Fones McCarthy, Orange Springs, Fa.

1st, I claim the feeding of the cotton to the drawing cylinder of the gin in a vertical direction, substantially in the manner as and for the purpose set forth.

2d, The fixed or stationary toothed bar, D, in combination with the reciprocating or vibrating toothed bar, E, when arranged or placed so that their teeth will be in a space between the feed box and the drawing cylinder down through which the cotton is fed to the drawing cylinder, substantially as shown and described.

67,328.—MACHINE FOR DRYING SIZED OR DYED CORDS, SKIRT-WIRE WEBBING, ETC.—Donald M. Inroy, New York City. Antedated July 20, 1867.

1st, I claim a series of steam drying pipes, i i. arranged in ranges in the manner specified in combination with cylinders, k, placed between the ranges of pipes as and for the purposes set forth.

2d, I claim the hand hole and cover, s, in combination with the cylinder, k, journal box, m, packings, n and q, and pipe, p, as and for the purposes set forth.

67,329.—ALARM WHISTLE.—William J. McLea, (assignor to himself and Charles F. Young,) Buffalo, N. Y.

1st, I claim the alarm whistle, C, constructed, arranged and operating in the manner substantially as herein described.

2d, So arranging the indicator in reference to a blank whistle or valve, that when the latter is raised for speaking through the tube, the indicator will be closed in the act of raising the valve substantially as set forth.

67,330.—FLOOR CLOTH AND CARPETING.—John B. Meldrum, Paterson, N. J.

I claim a carpet, drugget, or floor cloth, composed of bleached or whitened jute cloth, printed upon in figures as described.

67,331.—CIRCULAR SWINGING CRADLE AND BABY-WALKER.—Walter M. Messick, Louisville, Ky.

I claim a circular swing cradle and walker constructed substantially as described.

67,332.—FENCE.—William A. Middleton, Harrisburg, Pa.

I claim the headed bolts, C C, passing through the fence panels and top of the metal straps, D, when said straps are passed from the sill over the top of the fence and there secured by the nut in the manner and for the purposes specified.

67,333.—CORSET.—Wesley Miller, New York City, assignor to Francis E. Beal, Granville S. Webster, Edward J. Sawyer, and Paul P. Todd.

I claim an improved article of manutacture, a corset constructed in whole or in sections of raw or partially tanned hide or parchment, substantially as before explained.

I also claim perforating the said corset, for the purpose of ventilation and ornament essentially as set forth and explained.

67,334.—COTTON BALE TIE.—John F. Milligan, St. Louis, Mo.

I claim the tie piece, A, provided with the mortiser, b and b', the corners thereof being acute and shaped in the crescent form of cross section as herein described and when furthermore arranged with a central rail, a', of diminished thickness, substantially as and for the purpose set forth.

67,335.—FERTILIZER.—J. K. Moore, Millville, N. J.

1st, I claim the powdered clam or oyster shells as a fertilizer substantially as set forth.

2d, The ground shells, when used with the ingredients specified in the manner substantially as and for the purposes set forth.

67,336.—KNIFE CLEANER.—Curtis C. Morgan, Auburn, N. Y.

I claim the body, A, constructed as set forth in combination with box, B, and roller, C, when all are arranged as described.

67,337.—WINDOW CURTAIN.—D. G. Morgan, Jordan, N. Y.

I claim the arrangement of the plates, a a, wires, i i, and cords, D D', in combination with the roller, C, ratchet, y, and dog, m, whereby the curtain is raised or lowered and secured by the spring rod, in the manner substantially as and for the purposes specified.

67,338.—SQUARE.—J. Morss, Philadelphia, Pa.

I claim the slotted blade, B, and thumb screw and nut, or their equivalents, in combination with the stock, A, its parallel edges, a a, and bottom, f, of the slot arranged at right angles with the said edges, the whole being cons ructed as and for the purpose herein set forth.

67,339.—WARDROBE OR CLOSET.—Ignatz Moser, Cincinnati, Ohio.

1st, I claim the provision in a closet or wardrobe of the revolving frame, E, e e' F J J', as and for the purpose stated.

2d, In combination with the frame, E e e F J J', I claim the curved guards, K.

3d, I claim a closet or wardrobe composed of separable parts, A B C, fastened together by clamps, D d, and keys, N, or their equivalent for the purpose set forth.

67,340.—STEAM BOILER.—Richard Needham, Dukinfield, Eng. Patented in England Dec. 26, 1861.

I claim the combination with a steam boiler of one or more funnels or open mouthed skimmers so constructed and arranged and provided with an exit pipe as to collect the scum from the surface of the water substantially as herein above set forth.

67,341.—CLOTHES-LINE HOOK BLOCK.—Joseph W. Norcross, East Boston, Mass.

I claim a clothes line or hook block, the shell of which is provided with an aperture, a, and loop, b, and made in one continuous piece of iron or other metal as shown and described.

67,342.—BOAT AND TRUNK.—J. A. Olmstead, New York City.

1st, I claim the convertible boat and trunk composed of three sections hinged to each other and arranged to fold together, substantially as herein set forth.

2d, The lockers, d, arranged in relation with the space. e, of the central section, B, substantially as and for the purpose herein set forth.

3d, The lockers, g arranged in relation with the space, e, of the stern section, A, substantially as and for the purpose herein set forth.

4th, The rowlocks, a*, constructed and arranged to serve as handles when the boat is used as a trunk, substantially as herein set forth.

67,343.—BUCK SAW FRAME.—Solomon Oppenheimer, Peru, Ind.

I claim the above described attachment to the saw frames or its equivalent, when used and applied for the purpose and in the manner shown and explained.

67,344.—COOKING STOVE.—D. E. Paris, Troy, N. Y.

I claim 1st, the revolving damper or flue plate made to operate in the chamber under the reservoir as follows, when lying horizontally it drives the heat or products of combustion under the bottom of the reservoir, when turned up vertically, allows it to pass directly into the exit pipe, and shuts it off from the reservoir by closing the opening through, or under the back of the stove.

2d, I claim the return flue chamber, or open seat under the reservoir, connected with the central rear flue of the stove, by an opening through or under the back plate of the same, in combination with the revolving damper or flue plate, within said chamber, and the reservoir above.

3d, The construction of the annular cap or top rim, N, which shall entirely surround the top of the reservoir, with the outer edge of said rim turned both upward and downward, so as to form at once a finished molding for its outer edge and also a water guard for the purpose of conducting any water spilled upon the top down into the reservoir, substantially as herein shown and described,

4th, I claim the backward and forward motion of the heat, in other words, a return flue, underneath a reservoir, situated in rear of a driving flue cooking stove, in combination with a revolving damper, or a controlling flue plate creating or directing such flue as it passes out from the rear flue or flues of the stove and then back again for the purpose of heating the reservoir.

67,345.—BLOWER.—Wm. A. Parmele, New Haven, Conn.

I claim 1st, The oscillating fans, D, with valves, E, in combination with the bottom plate, A, with valves, B, and case, F F1, forming an air passage, F2, said parts being respectively constructed and arranged substantially as set forth.

2d, The fans, D, attached to the shafts, C C', in combination with the arms, I I', connecting rods, H H', and pulley, G, and arranged to operate substantially as set forth.

67,346.—CORKING BOTTLES.—C. H. Porter, Albany, N. Y.

I claim a screw furnished with an eye or loop at one end when such screw is inserted in a cork substantially as and for the purpose described.

I also claim in combination with the above, a chain having a spring catch or their respective equivalents and hung to the neck of a bottle substantially as described for the purpose specified.

67,347.—TRESTLE AND SCAFFOLD SUPPORTER.—Jacob Reef, Jr. (assignor to Wm. H. Williamson, Frank Powers, and Hiram W. White), Olney, Ill.

I claim 1st. The extensible tie bar, D D', when used in combination with the sliding bars, A A', legs, B, B', and diagonal braces, E E', as and for the purposes set forth.

2d, The legs, B, connected to the bars, A A', by bolts, G, affording rigid lateral support, and adapted to fold longitudinally against the bars as represented.

3d. In combination with the sliding legs, B B', of a trestle of the construction described. I further claim the two bands, a a, one attached to the upper end of the sliding leg, B', and enclosing the leg, B, the other attached to the lower end of the leg, B, and enclosing the leg, B', as and for the purposes set forth.

67,348.—MACHINE FOR ROLLING HORSE SHOE BARS.—Abram Reese, Pittsburgh, Pa.

I claim 1st. A pair of cylindrical metallic rolls, one grooved and the other flanged with a projecting creaser or creasers, i, in the bottom of one or more of the grooves, and one or more projecting formers, s, on the outer face of the corresponding flanges, in combination with one or more spring guides, f, all constructed arranged and operating substantially as described.

2d, A pair of cylindrical metallic rolls, one having one or more creasers, i, on its outer cylindrical surface, and the other shouldered or made with a recess, h, and print, s', in combination with a vertical friction roller, n, all constructed arranged and operating substantially as and for the purposes above described.

67,349.—WEIGHING SCALES.—W. W. Reynolds, (assignor to the Howe Scale Company, Brandon, Conn.

I claim the arrangement and combination of the weight holder or disked cap, C, with the standard, B, the lever, A, and its fulcra.

I also claim the combination and arrangement of the extensions, b b, and the studs, c c, or the equivalent thereof, with the weight and scale pan supporters, as set forth.

67,350.—MANUFACTURE OF IRON.—William Haden Richardson, Glasgow, North Britain.

I claim, 1st, The process or processes of manufacturing or producing improved malleable iron, as hereinbefore described or any mere modification thereof.

2d, The introduction thereof of a blast or blasts of air or air and steam either separately or combined into the body or mass of metal in the puddling chamber facilitating the manufacture and for the purpose of improving the quality of iron (in contradistinction to blowing air or steam upon the surface of the charge), as hereinbefore described or any mere modification thereof.

3d, The process of manufacturing iron by first introducing air or steam into its mass in the puddling chamber and afterward finishing it in the manner of puddled iron, as hereinbefore described or any mere modification thereof.

4th, The use and construction of hollow rabbles, passages or openings for the purpose of introducing a blast or blasts of air or steam into the mass of molten metal in the puddling chamber, as hereinbefore described or any mere modification thereof.

5th, The introduction of pulverized oxide of manganese (or other substance containing oxygen in combination) into the mass of molten metal in the puddling chamber, as hereinbefore described or any mere modification thereof.

67,351.—GANG PLOW.—D. C. Riggs, St. Joseph, Mo.

1st, I claim, in combination with the plows, B, the employment or use of horizontal or rotary cutters, D G, arranged and applied to operate in the manner substantially as and for the purpose set forth.

2d, The lifting or elevating bar, K, when arranged in connection with the axle, draft pole and plow beams, to operate in the manner substantially as and for the purpose specified.

3d, The shaft, L, on the axle, H, provided with the arms, k k l, and arranged in relation with the elevating bar and plow beams, to operate in the manner as and for the purpose set forth.

67,352.—PUNCH AND SHEARS.—D. D. Robinson, Niles, Mich.

1st, The wheels, D and E, with their punches and dies, all constructed, arranged and operating substantially as described.

2d, The stand, A, having at one end the die wheel, E, and rack-inclined plane, L, at the other, with the portion, b. of the shears supported about its middle in combination with the spring beam. B, with the punch wheel, D, at one end, the rack-inclined plane, L', at the other, and bearing the portion, a, of the shears, the rollers, m m, being arranged therewith and operating substantially as described for the purpose specified.

3d, I claim the set screw, R, in combination with the adjustable inclined plane, L, and the geared rollers, m m, substantially as described.

67,353.—DOUGH KNEADER.—P. W. Robinson, New Bedford, Mass.

I claim the combination of the frame, A, rollers, B, tray, C, and adjustable corrugated roller, D, substantially as described for the purpose specified.

67,354.—WATER TANK AND REFRIGERATOR.—William Rosenkranz and Michael Esch, St. Paul, Minn.

I claim the tank, E, when arranged as herein shown and described in combination with the drawer, H (perforated), false bottom, D, revolving ring, I, and case, A, of a refrigerator, all made substantially as set forth.

67,355.—MACHINE FOR GRINDING REAPER KNIVES.—Edwin M. Scott, Auburn, N. Y.

1st, I claim, in combination with disk, C, the slides, B B, and thumb screw, d, as and for the purpose set forth.

2d, I claim the disk, C, slides, B B, loose bolt, E, lever, G, all combined substantially as and for the purpose specified.

67,356.—TOBACCO PIPE.—Charles E. Searles (assignor to himself, Edwin Hoyt and Lafayette Farrington), Stamford, Conn.

I claim the combination with the bowl and stem of a tobacco pipe of the socket, C, and cup, D, both provided with an aperture or apertures in the top and the former with the holes or apertures, d e, on opposite sides and the latter with the holes, i j k, on opposite sides, all arranged and operating substantially as herein specified.

67,357.—HANGING STIRRUP.—Prentiss Selby, San Francisco, Cal.

I claim combining with the ordinary stirrup straps of a saddle an elastic strap that will constantly tend to keep the stirrup to the foot of the rider, while his weight is taken upon the ordinary leather strap, substantially in the manner and for the purpose described.

67,358.—APPARATUS FOR MAKING SHEET-METAL PANS.—William Serriss, Sidney, Ohio.

1st, I claim the combination of the two clamping plates, a, with the adjustable gage, f, substantially as and for the purpose specified.

2d, The arrangement of the gage, f, between the clamping plates, a, for operation substantially as herein set forth.

67,359.—SPRING BED.—T. W. Shapleigh and M. J. Colman, Boston, Mass.

We claim the arrangement and combination of the cross bar, C, the screw, D, and nut, E, with the slat and the conical spring with the base coil connected with the next coil of the spring, substantially as set forth.

67,360.—CALIPERS AND DIVIDERS.—Leonard Shelters (assignor to himself and John Pattee), Manchester, N. H.

I claim the combination of the calipers and arms, B B', together with the points, H H', forming the legs of the dividers and turning on the pivot, C, and on which arms are marked the divisions of a rule or scale, and the stop, D, the thumb screw, G, in the slot, F, or their equivalents, substantially as set forth.

67,361.—BOILER CLEANER.—W. P. Slensby, Chicago, Ill.

I claim the arrangement of the circular plates, C C', secured together by rods, a, band, D, thimble or rings between said plates, screw rod, E, substantially as herein shown and described, whereby to clean the interior surfaces of steam generators and the exterior surface of the boiler tubes, and at the same time agitate the water in the boiler.

67,362.—BED BOTTOM.—Eleazer Small, Dennisport, Mass.

I claim the perforated bars, C C, with metal plates, D, at each end, for securing the pins, e e, of the bed bottom as constructed, and to adjust the same to suit the size of the bedstead, all constructed and used in the manner as specified.

67,363.—WINDOW BLIND.—Hiram Smith and T. J. Lumis, Norwich, Ct.

We claim the construction of movable blind slates with square shoulders, b b, in combination with stiles which are constructed with rounded or reduced edges, substantially in the manner and for the purposes described.

67,364.—ESCAPE PIPE FOR STEAM ENGINES.—Joseph Smith, Philadelphia, Pa.

I claim a steam escape pipe for high pressure engines, locomotive or stationary, whose inlet and exit openings shall be of uniform or nearly so areas and of much less area than a portion at or near the exit thereof, so that the steam can expand, loose its force, and become muffled, before its escape into the air, substantially as and for the purpose described.

67,365.—MACHINE FOR PULLING HOP POLES.—William Smith, Nunda, N. Y.

I claim the attaching of the iron beveled jaws to the end of a beveled lever and working within a quadrangular band, which gives the jaws a side draft upon the pole thereby raising it perpendicularly up the more force applied to the lever, the more firmly the jaws grasp the pole or anything that is to be drawn out of the ground.

67,366.—METHOD OF PRESERVING WOODEN PILES.—W. Harrold Smith. Memphis Tenn.

I claim the wooden pile, timber or structure, A, protected substantially in the manner and for the purposes set forth.

67,367.—CAR COUPLING.—P. H. Snelling (assignor to himself and James Nutt), Wartrace, Tenn.

I claim the combination of the spring-pressed plunger, B, within the draw head having an upper projection or lip, d, in front, coupling pin, D, and stirrup. E, all for operation relatively to and in connection with the coupling link, substantially as specified.

67,368.—DRAW HEAD FOR RAILROAD CARS.—W. S. Shotwell, Patterson, N. J.

1st, I claim the shoulders, a2, upon the drawheads, B, constructed as described whereby the drawheads are prevented from slipping by each other when brought together, substantially as herein shown and described.

In combination with the above, I claim the springs, e e, upon the inner end of the draw head and upon each side of the cross bar, d, whereby the shock of the drawhead upon the shoulders, a2, as they approach each other is partially relieved, substantially as described for the purpose specified.

67,369.—SAWS.—W. R. Stephenson, Transfer Station, Pa.

1st, I claim the teeth, B B' constructed as described provided respectively upon opposite sides with the inclined grooves, b, and having the cutting lips, c d, and inclined bevel surfaces, a, as herein set forth for the purpose specified.

67,370.—suspended.

67,371.—PROP BLOCK FOR CARRIAGE TOPS.—W. H. Stickel, Knightstown, Ind.

I claim the prop block, A, when provided with the dovetailed groove, e, adapted to receive the corresponding dovetailed elastic removable strips, D, operating as described for the purpose specified.

67,372.—ROTARY HARROW.—P. B. B. Stiles, Galesburg, Ill.

1st, I claim the rotating harrow wheels, A, formed by the combination of the rim, a4, arms or spokes, a, clamping plates, a3, and cutter pins, B, with each other, substantially in the manner herein shown and described and for the purpose set forth.

2d, The combination of the adjustable loops or clevises, F, with the cutter pins, B, and coupling bar, D, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the draft bars, C, and short chains, c1, with the center pins, B, and axle. G, of the sulkey, substantially as herein shown and described and for the purpose set forth.

67,373.—BURNING FLUID.—M. L. Stoddard, Corning, N. Y.

I claim the within named ingredients when mixed in the proportions herein set forth for the purpose described.

63,374.—APPARATUS FOR CUTTING FILES.—S. A. Sutton, Pawtucket, R. I., assignor to himself and Lysander Flagg, Smithfield, R. I.

1st, I claim the adjusting of the cutter, T, relatively with the face or surface of the file blank by means of the pivoted bar, N, circular plate, V, with cutter arm, Y, attached, and the arm, k, of the nut, J, to act upon the bar, N, substantially as shown and described.

2d, The regulating of the force of the blow of the hammer by means of the arm, U' bearing against the spring, Q, and operated by the arm, k, of the nut, J, and the pivoted bar, M, substantially as shown and described.

3d, The cutter arm, Y, pivoted in the bearing, s, of the bolt, W, in combination with the cutter, T, and semi-cylindrical bed, A' for the blank, substantially as set forth.

67,375.—DOGS FOR SAW LOGS.—Samuel Sykes, Chippewa Falls, Wis.

I claim the part, F, forming with the body of the dog, a bent lever as and for the purpose herein shown and described.

67,376.—PROPELLER.—C. E. Foley, Brooklyn, N. Y.

I claim the arrangement of the shaft, B, sleeve box, E, plate, D, crank, G, ratchet wheel, h, spring, i, clutch, J, shifting lever, k, spring, O, and stud, m, substantially as described for the purpose specified.

67,377.—SPITTOON FOR RAILROAD CARS.—Morris Traver, Poughkeepsie, N. Y.

I claim the construction and arrangement of the convex disk, E, to whose under side is secured the spring rod, E, within and supporting the hollow cone, C, working through the braced plate, G, and pressing up the said disk, E, against the braces, M, of the box, A, as herein set forth for the purpose specified.

67,378.—FOLDING CHAIR.—Gregor Trinks, New York City.

1st, I claim the scolloped bars, g, or their equivalents in combination with the seat, B, cross bars, f, and side pieces, A, of a folding chair constructed and operating substantially as and for the purpose described.

2d, The adjustable slides, f, in combination with the flexible arm pieces, h, of a folding chair constructed and operating substantially as and for the purpose set sorth.

67,379.—HARNESS HAMES.—Seth G. Tufts, Maineville, Ohio.

1st, I claim the strip, B, provided with flanges, b1, overlapping the sides of the hame, A, and fitting with grooves in the sides thereof, so that their outer sides shall be flush with the sides of said hame, as herein set forth for the purpose specified.

2d, The combination of the strap piece, E, with the open hame tug hook, C, and with the hame, A, substantially as herein shown and described and for the purpose set forth.

67,380.—HEDGE-TRIMMING MACHINE.—Armstrong Tweedy, Collinsville, Ohio.

1st, I claim the cutter, O, in combination with knives, R, when constructed, arranged, and operating in relation to the frame, G G1, in the manner and for the purpose described.

2d, The combination of the cutter, E, with bar, L, plate, M, post, P, and rod, J, when arranged to operate conjointly with cutter, O, and knives. R, in the manner substantially as and for the purpose specified.

67,381.—SADIRON HEATER.—David Utley, 2d, Moscow, N. Y.

1st, I claim the combination of the sides, B, with the shell, A, so arranged as to slide around and cover the slots around the handles, as herein set forth.

2d, The employment of the thickness of sheet metal, m, in combination with the slides so arranged as to be notched to adapt them to different sized handles, as herein set forth.

3d, Retaining the slides in position in the shell by the grooves, i, and projecting rim, k, as specified.

67,382.—APPARATUS FOR KINDLING FIRE.—Henry Van Ausdall, Keokuk, Iowa.

I claim the portable fire kindler, constructed as described, consisting of the hollow metallic cylinder, A, closed at each end, and having supply tube, B, the vertical parallel wick tubes, C, four or more, secured together by means of the cross piece, D, bail, E, pivoted at each end of the cylinder, A, adjusting wire, G, handle, H, attached to vertical rod, F, all arranged to operate as herein set forth for the purpose specified.

67,383.—COOKING STOVE.—Charles Van De Mark, Phelps, N. Y.

I claim the openings, b b, in the top plate of the stove, in combination with the cross partition, G, and valve or valves, a, for the purpose herein specified.

I also claim the notches or openings, i i, at the sides of the front boiler openings, in combination with the openings, b b, substantially as and for the purpose herein specified.

I also claim the combination of the boiler or heater, D, and the stove, each constructed substantially as described, and both operating together substantially as and for the purpose herein specified.

I also claim the division plate, h, either with or without the plate, g, on the boiler, for the purpose specified.

67,384.—DREDGING MACHINE.—Jean Louis Vergniais, Paris, France.

I claim, 1st, The undulating lower face of the sucker, having perforations on the sides of the undulations, substantially as described.

2d, The combination with the induction and eduction valves, K D, and the pump chambers, B, of the jointed pipe and perforated undulating-faced sucker, substantially as described.

67,385.—PAINT.—J. P. Vainsonheller, Urbana, Ohio.

I claim the fixing of the color of any pigment that may be used, by its combination with lime and copperas, as and for the purpose described.

67,386.—LIFTING JACK.—Richard Walter, Batavia, N. Y.

I claim the lever, C, stop block, D, and serrated plate, F, when acting in conjunction, as and for the purpose herein set forth.

67,387.—HARROW.—James Walsh, Stark county, Ill.

I claim the straps of iron, B B and C C, with their hooks, e, and eyes, d, or hinges, and arranged in pairs, the jaws, a b c, on their undersides, also the regulating holes, i i, also the attachment or extension straps, D D, for carrying additional timbers, E E, all for the purposes described, and combined in the manner above stated.

67,388.—MOP WRINGER.—Charles E. Wareham, Sedalia, Mo.

I claim, 1st, The roller, D, set in the swinging frame, E, which is journalled in B, all as set forth, in combination with the roller, C, also journalled in B, in manner and for the purpose substantially as described.

2d, The mop wringer, composed of two rollers, D and C, mounted in the uprights, B B, on floor, A, castors, a, substantially as described.

67,389.—GRAIN BINDER.—George Warner, West Liberty Iowa.

1st, I claim the combination with the bar E, arm F, finger G, and wire H, the griping, cutting, and twisting device composed of the wheel K, provided with teeth g, the holder L, with knife l, slotted wheel P, and revolving forked bar e', all arranged to operate substantially as and for the purpose set forth.

2d, The shaft S, for giving motion to the griping, cutting, and twisting device connected with the shaft B, by the gearing X Y, in combination with the pin n, attached to the slide v, the holes b', in the wheel X, and the bar V, connected with an arm o, on shaft p, and provided with the slide U, having the forked bar e', attached, and also provided with a pendent pin g', fitted to the grooved hub Y', all arranged to operate substantially in the manner as and for the purpose set forth.

67,390.—TABLE-LEAF SUPPORT.—William Whitworth, Cleveland, Ohio.

I claim one or more springs E, placed upon the side of the hinged arm D, in combination with the slotted stay C, in the manner as and for the purpose substantially as set forth.

67,391.—MODE OF PUTTING UP AND PRESERVING BUTTER.—John Wilcox (assignor to himself and John Hooker), Springfield, Mass.

1st, I claim the combination of the cups a a a, with each other and with the main jar A, substantially as specified for the purpose set forth.

2d, I claim the elastic cushion c, in combination with the bar b, grooves g g', and followers e, as and for the purpose specified.

3d, I claim a packing k, for the protection of the cups a a a, within the main jar A.

4th, I claim a butter cup and stamp or marker a, when made in one and the same piece, substantially as and for the purpose described.

67,392.—VALVE GEAR.—Furman R. Wilson, N. Y. City.

1st, I claim the combination of the crank Q, sliding lever M, and valve-rod L, in the manner and for the purpose substantially as set forth.

2d, The combination of the rod K, cam c, lever r, and rod U, in the manner and for the purpose substantially as set forth.

67,393.—BAG FASTENER.—Abraham M. Wright (assignor to himself and F. R. Witmer), Safe Harbor, Penn.

I claim the arrangement of the ring, D, cord, C, link, B, in combination with my combined hook and wedge lever, A A', all constructed and operating in the manner and for the purpose specified.

67,394.—MACHINE FOR BURRING WOOL, ETC.—Robert J. Clay, Greenpoint, N. Y., assignor to himself, J. T. Husted, E. G. Burling and Cornelius Corson.

1st, I claim the combination, with suitable feeding mechanism and knife or clearer, J, of a rotating cylinder, provided on its periphery with smooth comb-like plates or strips, arranged to encircle the cylinder, and with their teeth in tangential relationship thereto for operation together, substantially as specified.

2d, And in combination therewith I claim the construction of the plates or strips, F, with their teeth, a', beveled from beneath or or inner faces thereof and their rear edges, b', inclined from above or outer faces of the same, essentially as shown and described.

3d, The combination, with a cylinder encircled by comb-like strips, of a knife or clearer, J, arranged on its clearing edge or edges to occupy an inclined position relatively to the strips or the latter an inclined relationship to the clearer for operation together, substantially as herein set forth.

4th, In combination with the feeding rolls, guiding plate, or tray and laying roller, or their equivalents, the comb or comber, H, having a curvilinear travel across or relatively to the feed, essentially as specified.

REISSUES,

2,701.—BRIDGE.—David Hammond and W. R. Reeves Canton, Ohio. Patented June 21, 1864.

We claim, 1st, The arch, A, constructed of the side pieces, a a, top piece, b clamping pieces, c c and n n, bolts, d d, nuts, e e, the whole combined substantially as herein specified.

2d, The combination of the arch, A, constructed as hereinbefore specified,

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the string pieces, D D, suspension rods, B B, diagonal brace, C C, and shoes, E E, substantially as herein set forth.

2,702.—Method of Casting the Driving Wheels of Horse-powers, Harvesters, etc.—E. P. Russell, Manlius, N. Y.—Patented Aug. 15, 1865.

I claim, 1st, Placing the pulley pins of driving wheels in the sand or mold by means of a model driving wheel so as to secure equidistance between the pins, substantially as and for the purposes specified.

2d, The combination of the driving wheel, A, the pin, C, and the friction roller, B, constructed in the manner and arranged substantially as described.

2,703.—Plow.—Frederick Volkman, Hoboken, N. J., assignee of Bruno Velkman. Patented Nov. 27, 1866.

1st, I claim a plow cart that is made and operating substantially as and for the purpose herein shown and described.

2d, The device for raising and lowering the front end of the plow beam, L, by means of the screw shaft, I (fitted in the axle, D, and sliding block, b), the nut, c, and plate, f, balance bar, e, links, g and r, all made and operating substantially as herein shown and described.

3d, The adjustable links, n, when so made by the application of a set screw, n', substantially as and for the purpose herein shown and described.

4th, The draft chain, K, attached to the underside of the plow beam and to the landside of the same or, in other words, to the lower left-hand edge of the same, substantially as and for the purpose herein shown and described.

5th, The perforated axle, D', in combination with the frame, B A E, and sliding block, b, for the purpose of allowing the lateral adjustment of the screw shaft, I (or its equivalent), substantially as and for the purpose herein shown and described.

6th, The manner herein shown and described of adjustably securing the draft bar, G, to the plow cart by means of the perforated axle, D', bolt, h, and semicircular front plate, D, and pin or set screw, S, all made and operating substantially as herein shown and described.

7th, In combination with the device for adjusting the plow beam up and down the wheel, F, of the cart, when so arranged that by its adjustment the axle of the cart can be sunk more or less, as set forth.

8th, Hanging the front end of the plow beam directly to the screw shaft, I, by means of links, g g, balance bar, e, and nut, c, all made and operating substantially as herein shown and described

9 h, The draft chain, K, when secured to the plow in the manner described in combination with the laterally as well as obliquely adjustable draft bar G, as set forth.

2,704.—Cider Mill.—W. N. Whiteley, Jerome Fassler and Oliver S Kelly, Springfield, Ohio. Patented Dec. 15, 1863.

1st, We claim the press beam, B, constructed with the lugs, G G, upon its lower part and at a distance from ends, as and for the purpose shown and described.

2d, The arrangement of the posts, A A, press beam, B, girder, C, rails, E E, post, F, and platform, I, to form the frame of a combined grinding and pressing fruit mill, as set forth and described.

2,705.—Stripping Top Flats in Carding Machines.—W. B. Bates, Mansfield, Mass., Administrator of the Estate of George Wellman. Patented March, 18, 1856. Antedated Nov. 25, 1853.

I claim, 1st, The combination of the segmental gear and its set rim or locking plate, with the pinion and its locking plate or recess, as a device for imparting an intermittent rotation to mechanism from a continuous one, for the purpose of operating the stripping mechanism, or that which moves the cleansing frame, from one top to another substantially as described.

2d, The combination of the said device for producing intermittent rotation, with the mechanism that lifts, strips, and lowers the top card to another substantially as described.

3d, The combination of the said device for producing intermittent rotation, with the mechanism that moves the cleansing frame from one top card to another, substantially as described.

4th, Combining and arranging the segmental gear and its set rim or locking plate, with the two pinions, each with its locking plate or recess, placed on opposite sides of said segmental gear, so as to operate the stripping apparatus, and move the cleansing frame alternately, substantially as described,

5th, The combination and arrangement of the mangle pins or teeth in the arc of a circle directly attached to the cleansing frame and concentric with its movements, for the purpose of avoiding intermittent gearing, substantially as described.

6th, Mounting the stripper card upon radial arms that have their centers or axes below the stripper card and near the axis of the cleansing frame, substantially as described.

7th, The combination of the cams, X X, with the levers, Y Y, carrying and operating the stripper card, substantially as described.

8th, The combination of the cams, X X, with the lifting rods, Z Z, and the levers, Y Y, arranged to operate in connection, substantially as described.

9th, The combination of the cams, X X, with the chain belts, Q', the chain pulleys, R', and shaft, M, arranged and operating substantially as described.

10th, The combination of the guide, E', on the cleansing frame with the stationary guide, D', on the frame of the machine co-operating substantially as described.

11th, The combination of the springs, F', and the pins, E', and lifting rods, L, and their application to the frame, S, substantially as described.

12th, The mechanism for cleansing the stripper card arranged and applied substantially as described.

2,706.—Stripping Top Flats for Carding Machines.—William B. Bates, Administrator of the estate of George Wellman, Mansfield, Mass. Patented Dec. 6, 1853.

1st, I claim the combination and arrangement of a continuously revolving radial arm and pin, or crank pin, and a circular locking plate connected therewith, with a series of intermittently revolving radial working grooves to receive said pin, connected with a locking plate provided with segmental recesses corresponding to said grooves and to the other locking plate, substantially as described.

2d, Combining with the cleansing frame, a mangle gear and the mechanism herein described for imparting an intermittent motion to the same suitably arranged, by which the cleansing frame is moved from one top card to another in any order desired, in both directions, and held at rest while the cleansing operation is performed, substantially as described.

3d, So combining and arranging the cleansing frame, the mangle gear and pinion, and mechanism for giving it intermittent motion, when the motion of the cleansing frame is from one top card to the next but one, that when the pinion passes around the extremity of the series of pins or teeth of the mangle gear to the opposite side of the same, the distance of the point from where the pinion starts to where it stops on the mangle gear will correspond to the movement of the cleansing frame from one top card to that next to it and thus shift the order of cleansing the top cards when the frame is moving in opposite directions, substantially as described.

4th, Attaching the stripping card to radial arms, so arranged that by the oscillation of said arms the stripping card will be carried beneath the raised top card to cleanse the same, substantially as described.

5th, Forming the working faces of the cams that raise the top cards in separate and detached segments, placed so as to act in succession in combination with a series of projections or working surfaces on the device that raises the top cards substantially as described.

6th, The combination and arrangement of the several correspondent parts of mechanism both new and old, so as to form a complete apparatus by which the top cards of a carding machine may be automatically stripped or cleansed, substantially as described.

2,707.—Bridge.—Zenas King, for himself and assignee of P. M. Frees, Cleveland, O. Patented Oct. 1, 1861.

1st, I claim, viz: The construction and arrangement of the arch when the same increases gradually in its vertical and lateral dimensions from the ends A' A", of the arch to its center or crown, substantially as and for the purpose set forth.

2d, The construction and arrangement of the arched or curved stay plates or channel irons in combination with arched bridges, for the purpose specified.

2,708.—Centrifugal Sugar Machine.—Alexander Mackey, New York City. Patented June 18, 1867.

I claim, 1st, The combination with the centrifugal cylinder of a distributor arranged within but detached from the said cylinder, substantially as and for the purpose herein set forth.

2d, The distributor, C, constructed essentially as shown, in combination with the centrifugal cylinder, B, and arranged in relation thereto substantially as and for the purpose herein set forth.

2,709.—Cooking Stove.—Daniel E. Paris, Troy, N. Y., assignee by mesne assignments of James R. Hyde. Patented June 10, 1862.

I claim, 1st, A reservoir thus situated and constructed with a concave front, next adjoining said rear flues, the back of which latter shall be of a similar and conforming shape, for the purpose set forth and herein explained.

2d, Bolting or fastening the reservoir to the upright plate of the stove, substantially as herein shown and described.

DESIGN.

2,713.—Coffin.—Henry Hoffman, Jenner's Cross Roads, Pa.

Note.—Fifty-four patents in the above list were obtained through the home office of the Scientific American, exclusive of a number solicited through the Washington branch.—Eds.

PATENT OFFICE DECISIONS

BEFORE THE BOARD OF EXAMINERS-IN-CHIEF OF APPEAL.

Interference Between the Applications of M. and D.

Elisha Foote for the Board.

M. has a patent granted Feb. 10, 1863, for a self-raking apparatus applied to a single-wheel rigid-bar reaping machine. The improvements consist in applying the same self-rake to a two-wheeled jointed-bar machine. D. has an extensive manufactory of reaping machines at Auburn, N. Y. M. appointed an agent residing at that place to endeavor to procure the adoption of his rake upon the two-wheeled reapers manufactured there, and instructed him fully, in February, 1865, as to the manner of making the application. In July following he went there personally, procured their adoption by D., spent two or more weeks in D.'s manufactory making the application, and entered into a contract with him for the use of his patent for a stipulated rent.

It is alleged by D. that the apparatus constructed under the supervision of M. was imperfect and did not operate satisfactorily; that the pulleys were not of the proper relative sizes, the cams were not of the right shape, etc. If all be admitted that he alleges to the full extent that he claims, it would fall short, in our judgment, of making him an inventor. It is a mistake to suppose that he is one who perfects the mechanical details is entitled to the patent. An inventor need not necessarily be a mechanic. He has a right to employ the mechanical skill and experience of others to carry out his conceptions, and it has been said that even their inventions in reference to details belong to him. It is hardly to be expected that the first structure should be perfect; a trial and some practice usually suggest many alterations, and these do not by any means deprive an inventor of his right to a patent.

We entirely agree therefore with the Examiner in awarding the patent to M., and his decision is affirmed.

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CONTENTS.

Chapter I.—Antecedents of the Slide-Valve and Steam Ports in the Cylinder. II.—The Proportion of Valves and Ports in the Cylinder; Common and Exhaust Relief Slide-Valves. III.—Equilibrium and Double-Ported Valves. IV.—The Proper Mode of Obtaining the Correct Amount of Lap. V.—The Effect of Expansion by the Action of the Slide-Valve. VI.—The Delineation of the Path of the Crank-Pin. VII. General Observations.

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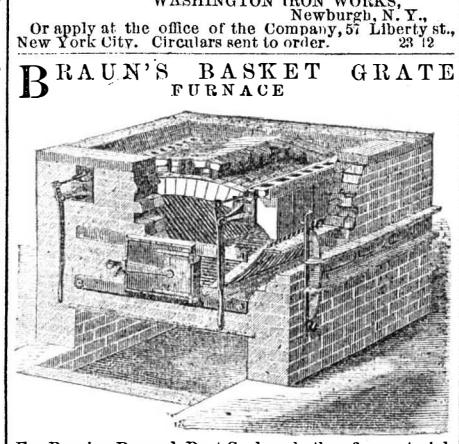

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THE 20TH ANNUAL EXHIBITION of the MARYLAND INSTITUTE FOR THE PROMOTION OF THE MECHANIC ARTS, Will be opened in the spacious Hall of the Institute, in Baltimore, on Tuesday Evening, Oct. 15, 1867.
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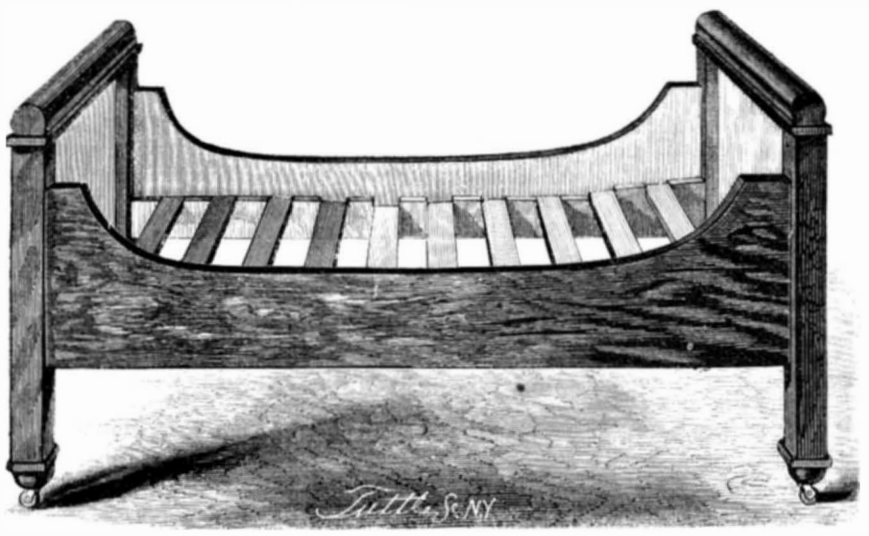
Improved Inclined Slat Bedstead.

Many devices have been resorted to with the object of promoting comfortable repose and rest, by improvements in bedsteads. A new invention in this direction has been patented by A. Rothwell, of Washington City, which consists in so arranging the slats as to produce a partially curved surface, adapted to the form of the body, as represented in the engraving.

The depression is made by deepening the mortises for three or four of the slats, about equidistant between the head and foot of the bedstead, so that a regular curve is formed, two feet in length and three inches greatest depth, more or less. In bedsteads having sufficient depth of rail or side piece, a further modification may be made, by raising above the level a slat or two at the head, so as to require a smaller pillow, as shown in the engraving.

This invention, while it is greatly promotive of the comfort of all persons, is especially adapted to contribute to the ease and rest of invalids. With this arrangement a comfortable bed may be made with a thin mattress. The invention commends itself to general use by its manifest utility and cheapness, costing little more than the common arrangement, and also being easily adapted to bedsteads already in use.



ROTHWELL'S IMPROVED BEDSTEAD.

The patentee may be addressed with reference to the disposal of rights.

Bayonet Wounds.

Our knowledge of bayonet wounds has been so limited that their effects have been, until a recent period, involved in considerable doubt and even mystery. Experience, however, teaches that we have exaggerated the nature of these injuries, and attributed to them formidable qualities which they happily do not possess.

Why is it that soldiers have such terrible fear of the bayonet? Why is it that the determined approach of a line of glistening steel makes the cheek blanch and causes the bravest hearts to waver? Why do we in many battles witness the rout of lines that have unflinchingly withstood a continued galling fire of musketry and artillery, as soon as the opposing line approaches closely with fixed bayonets? This dread of "cold steel" is, in my humble opinion, mainly attributable to ignorance of the nature of the injuries inflicted by it. There appears to exist in the minds of men a vague dread of transfixion by the bayonet. But this would probably not be so, were it generally known that bayonet wounds are almost harmless, when compared to the plowed tracks which the terrible minié bores through the tissues. The bayonet, on account of its less velocity, is easily diverted from a straight course by bony, cartilaginous, and tendinous tissues, and forms a smooth track, whilst the minié is relentless in its course, whirling with unimpeded force through all opposing structures, crushing, tearing, maiming all. A bayonet wound almost invariably heals by first intention under auspicious circumstances, and leaves no deformity behind, whilst the simplest ball wound requires weeks for a complete recovery, and then perhaps leaves the sufferer with a contracted and useless limb.—*Dr. Baruch.*

THE COMING EXHIBITION by the American Institute of the city of New York is of such general interest that we direct the attention of inventors and manufacturers to an advertisement in another column which informs those who desire to compete for prizes how they may, by prompt action, secure a place. We are informed that many novelties have already been promised and it is confidently asserted that this Exhibition will surpass all former displays by its extent, variety, and attractiveness.

PATENTS

The First Inquiry that presents itself to one who has made any improvement or discovery is: "Can I obtain a Patent?" A *positive* answer can only be had by presenting a complete application for a Patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After a season of great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning.

If the parties consulted are honorable men, the inventor may safely confide his ideas to them: they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

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All business committed to our care, and all consultations, are kept by us *secret and strictly confidential.* Address MUNN & CO., 37 Park Row, New York.

In Order to Apply for a Patent, the law requires that a model shall be furnished, not over a foot in any dimensions,—smaller, if possible. Send the model by express, pre-paid, addressed to Munn & Co., 37 Park Row, N. Y., together with a description of its operation and merits. On receipt thereof we will examine the invention carefully and advise the party as to its patentability, free of charge.

The model should be neatly made of any suitable materials, strongly fastened, without glue, and neatly painted. The name of the inventor should be engraved or painted upon it. When the invention consists of an improvement upon some other machine, a full working model of the whole machine will not be necessary. But the model must be sufficiently perfect to show, with clearness, the nature and operation of the improvement.

New medicines or medical compounds, and useful mixtures of all kinds, are patentable.

When the invention consists of a medicine or compound, or a new article of manufacture, or a new composition, samples of the article must be furnished, neatly put up. Also, send us a full statement of the ingredients, proportions, mode of preparation, uses, and merits.

Preliminary Examination.—In order to obtain a Preliminary Examination, make out a written description of the invention in your own words, and a rough pencil or pen-and-ink sketch. Send these with the fee of $5 by mail, addressed to MUNN & CO., 37 Park Row, and in due time you will receive an acknowledgment thereof, followed by a written report in regard to the patentability of your improvement. The Preliminary Examination consists of a special search, which we make with great care, among the models and patents at Washington to ascertain whether the improvement presented is patentable.

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Reissues.—A reissue is granted to the original patentee, his heirs, or the assignees of the entire interest, when by reason of an insufficient or defective specification the original patent is invalid, provided the error has arisen from inadvertence, accident, or mistake, without any fraudulent or deceptive intention.

A patentee may, at his option, have in his reissue a separate patent for each distinct part of the invention comprehended in his original application, by paying the required fee in each case, and complying with the other requirements of the law, as in original applications.

Each division of a reissue constitutes the subject of a separate specification descriptive of the part or parts of the invention claimed in such division; and the drawing may represent only such part or parts. Address MUNN & CO., 37 Park Row, for full particulars.

Caveats.—A Caveat gives a limited but immediate protection, and is particularly useful where the invention is not fully completed, or the model is not ready, or further time is wanted for experiment or study. After a Caveat has been filed, the Patent Office will not issue a patent for the same invention to any other person, without giving notice to the Caveator, who is then allowed three months time to file in an application for a patent. A Caveat, to be of any value, should contain a clear and concise description of the invention, so far as it has been completed, illustrated by drawings when the object admits. In order to file a Caveat the inventor needs only to send us a letter containing a sketch of the invention, with a description in his own words. Address MUNN & CO., 37 Park Row, N. Y.

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Foreign Patents.—American Inventors should bear in mind that, as a general rule, any invention that is valuable to the patentee in this country is worth equally as as much in England and some other foreign countries. Five Patents—American, English, French, Belgian, and Prussian—will secure an inventor exclusive monopoly to his discovery among ONE HUNDRED AND THIRTY MILLIONS of the most intelligent people in the world. The facilities of business and steam communication are such that patents can be obtained abroad by our citizens almost as easily as at home. The majority of all patents taken out by Americans in foreign countries are obtained through the SCIENTIFIC AMERICAN PATENT AGENCY. A Circular containing further information and a Synopsis of the Patent Laws of various countries will be furnished on application to Messrs. MUNN & CO.

For Instructions concerning Foreign Patents, Reissues, Interferences, Hints on Selling Patents, Rules and Proceedings at the Patent Office, the Patent Laws, etc., see our Instruction Book. Sent free by mail on application. Those who receive more than one copy thereof will oblige by presenting them to their friends.

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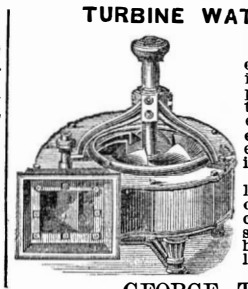

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